DOCUMENT RESUME

ED 183 358 SE 027 958

AUTHOR Fitz, Raymond: And Others
TITLE An Integration of Normative Models for Environmental Education.
INSTITUTION Battelle Memorial Inst., Columbus, Ohio.; Dayton Univ., Ohio.; University of Northern Iowa, Cedar Falls.; Virginia Univ., Charlottesville.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Office of Environmental Education.
PUB DATE 30 Jun 78
CONTRACT 5-22033
NOTE 83p.: Contains occasional small print in Figures
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Conceptual Schemes; *Curriculum Development; *Educational Development; Educational Improvement; Educational Objectives; Educational Research; *Educational Strategies; Educational Technology; *Environmental Education; *Models; Theories

ABSTRACT

This report summarizes the approach taken to construct a normative model of environmental education. Three sections are included in the report. The first section describes the background of the model including the project context and the purpose of the model. The second section describes the method of constructing the model. The third section describes the resultant normative model and includes numerous figures portraying the model and its subsystems. Appendices provide specific data on elements of the model. (RE)

AN INTEGRATION OF NORMATIVE MODELS FOR ENVIRONMENTAL EDUCATION

Raymond Fitz, S.M.
Joanne Troha
Lorna Wallick

30 June 1978

Prepared under Sub-contract No. 5-22033
from the University of Virginia

Sponsored by the Office of Environmental Education
under the Environmental Education Act of 1970
(P.L. 93-278)

UNIVERSITY OF DAYTON
DAYTON, OHIO 45469

RESEARCH INSTITUTE

5 September 1978

Dear Leesburg Institute Participant:

This report represents completion of one phase of a contract let by the Office of Environmental Education (OEE) to the University of Virginia and several sub-contractors. The purpose of this phase has been to study environmental education as it has been supported by OEE, to compare it to environmental education as specified by the Environmental Education Act and its amendments, and to identify aspects of the Act that are not being met. The next phase of the contract will be to design improved ways to implement all aspects of environmental education, especially those required by the Act that have not been put into effect.

Under the direction of John Warfield at the University of Virginia, Battelle Columbus Laboratories, the University of Northern Iowa, and the University of Dayton developed normative models of environmental education. A normative model describes a system, in this case environmental education, as it should or could be, and not necessarily as it is. The University of Dayton group was responsible for combining the various models and documenting the process and results in this report.

The normative model that we produced is very large and quite complex. We never intended it to be used in its present state as a communication piece, but rather as a means to organize and study what various people (educators, researchers, government officials, legislators, citizens, etc.) have said environmental education should be. As such, it represents a management framework that the Office of Environmental Education can use to plan its future technical assistance to environmental education practitioners and to evaluate the success of its programs.

On page 18 you will find a generalized version of the normative model. All of the 161 components of the model have been placed in one of the seven subsets shown on page 18. These are:

- Planning
- Dearning Systems Design
- Personnel Development
- Learning Activities
- Learning Outcomes
- Delivery Systems and Support
- Evaluation

The flow of the model from the bottom to the top indicates that each category of activities supports those categories above it, and all are interconnected through dissemination and evaluation feedback. For this reason, the Office of Environmental Education is making this report available to past and current grantees, in order that the general educational community including both formal educators and community educators can see how their work fits into the overall program as envisioned by the OEE, and can conceive new, fresh approaches to areas that up to now have been neglected.

The model is meant to illustrate a desirable process for environmental education--you provide the content in context. The OEE, by working with the education community, hopes to facilitate the linkages among you that will make the process work. To do so, the Office must learn what you think of its preliminary management framework, what you think it lacks, what you like about it, how you would want to work with it. We solicit your comments.

Sincerely,

Lorna Wallick

Lorna Wallick

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AN INTEGRATION OF NORMATIVE MODELS FOR ENVIRONMENTAL EDUCATION

This report summarizes the approach taken to construct a normative model of environmental education under Sub-Contract No. 5-22033, which is being funded by the Office of Environmental Education. The project is being directed from the University of Virginia, with participation from Battelle, the University of Dayton, and the University of Northern Iowa. Participation of Vanderbilt University and the University of Illinois is sought for the near future.

Under the direction of John Warfield, each of the three subcontractors developed a normative model of environmental education. The University of Dayton working group was responsible for integrating the various models and documenting both the process and results in this report. There are three sections in the report. Following a brief statement that places this model within the overall context of the project, the report describes how the integrated normative model evolved. In Section III, the model itself is presented and examined in terms of its major subsets of elements.

I. Background of the Part 3 Model

Project Context

The normative model of environmental education presented in this report completes Part 3 of a seven part Interpretive Structural Model (ISM), the development of which leads up to the major deliverable items for the contract, as indicated in Figure 1. Much of the ISM work is prerequisite to the development of designs and strategies called for in the RFP, and then subsequently to the prescriptive analysis. Parts 1 and 2 have already been completed. Figure 1 shows that the ISM Part 3 normative EE map precedes the Part 4 implementation goals map and the Part 5 implementation strategies map, leading up to the evaluation manual and designs and strategies for EE, and culminating in the prescriptive analysis.

Purpose of the Part 3 Normative Model

To provide this support to the subsequent Parts of the project, the Part 3 model was produced. Our purpose was to review statements that legislators, educators, researchers, and other experts have made about what environmental education should be, and to make explicit the desired or normative model of environmental education expressed or implied in various sources. This was accomplished by a search through the Arizona report, the Tbilisi report, the EE Act and Regulations, and other documents concerned with normative environmental education. From these, implied elements were extracted and organized into a logical structure. Additional elements that were deemed important were added by project personnel.

Our intention in carrying out this task was that the resulting model could be used to help establish future goals and directions for environmental

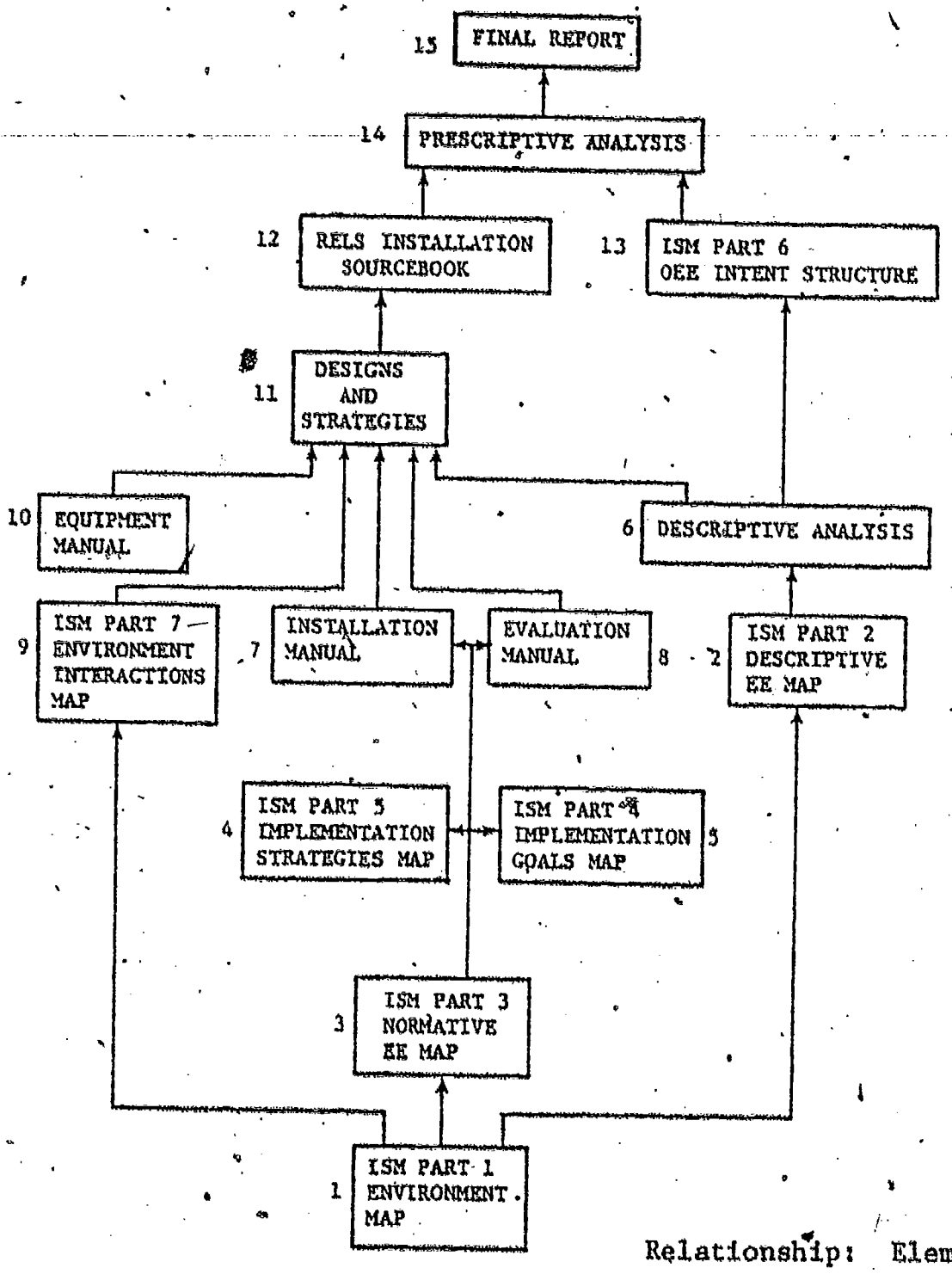


Figure 1. Project Deliverables (from: Warfield's second quarterly report)

education. Once we had structured and integrated the statements of experts into a model, we recognized the product as a management framework for environmental education.

II. The Method of Constructing the Normative Model

Work on a normative model of environmental education has progressed through three stages. First, the working groups at Battelle, the University of Northern Iowa, the University of Dayton, and the University of Virginia held individual preliminary sessions to construct their own initial models. The second stage involved a two-and-a-half day intermediate session in Dayton at which representatives of the groups worked to integrate the four maps. In the final stage, the University of Dayton group completed the process of integration and documented the results for review by the other participants. This final report incorporates comments received from the prime contractor as well as from the other subcontractors.

Activity 1. Generating the Elements

The initial list of 103 elements was supplied by John Warfield; the elements were those named or implied in:

- EE Act and Regulations, specifically elements identified for the Channel Inn Session
- the Arizona Report
- the Tbilisi Report
- past OEE grant descriptions

This list was distributed to the subcontractors with the instructions to use it and modify it as necessary, keeping track of the original source of each element. Additions to the element list were also acceptable, provided reasons were stated.

Activity 2. Preliminary Structuring Sessions

All four working groups began their preliminary modeling sessions for Part 3 with the same initial element list. The groups, however, were free to amend

this list as they saw fit, and to choose the elements they wanted to include in their preliminary models.

Battelle's preliminary normative model of environmental education was based on the relationship: "Element A should be included in Element B." Thirty-seven elements were incorporated in the model. In presenting their models (both normative and descriptive), the Battelle group included a list clarifying the terms they used. One of the important distinctions later used by the entire group in Dayton was Battelle's definition of "evaluation" vs. "assessment." Battelle's hierarchy of terms would progress from "conduct" to "evaluate" to "assess" to "plan." Their preliminary Part 3 model shows "assessment" referring to "a consideration of alternative options, actions, and methods of conducting actions."

The preliminary map completed by the University of Northern Iowa group consisted of 41 elements, out of their refined list of 79 elements. Based on the relationship, "Element A helps achieve Element B," programs for teacher training (for both formal and informal environmental education) appear at the top of the model. A cycle of 19 elements appears at the left of the model. The activities embodied in these elements are largely learning outcomes, rather than activities that will be undertaken by teachers or community educators, which probably accounts for their position apart from the other elements. More will be said about learning outcomes and learning activities in Section III.

The other two groups -- from the University of Dayton and the University of Virginia -- produced preliminary normative maps that show a great deal of similarity. Both groups decided to sort the master element list into subgroups. The University of Virginia graduate students used six categories: learning objectives; professional education; formal (conventional) education; informal education; support services (in general); and dissemination support services.

A separate model was constructed for each category, using the relationship "Element A contributes to Element B." A final structure showed how the "mini-structures" are related.

The University of Dayton working group also used categories to key the elements into learning outcomes, personnel development, formal education, community (informal) education, resource development, and curriculum development. Rather than constructing separate maps, however, the UD group used the keys to select representative elements from each category to build one model of 26 elements (Appendix B). The relationship used for this model was: "Should Element A logically precede Element B in the first iteration?" UD's preliminary model was limited to elements that pertain to environmental education activities; thus elements dealing with learning outcomes (such as "acquire" skills or abilities) were not used in the model. The exercise also led the UD group to minimize the distinction between formal and community education. Thus terms like "curriculum" and "teacher" are used in a broad sense in the UD preliminary model to apply to both the formal and informal sectors.

The purpose of the separate preliminary sessions on Part 3 was to enhance the quality of discussion at the subsequent meeting of the Combined Working Group. It was felt that developing a normative map of environmental education was a more challenging task than describing the "environment" or "environmental education" because value judgments were needed to construct what should be. Four groups with diverse backgrounds worked independently to explore differences in values, terminology, and conceptual understanding. They were then invited to share these insights at the Dayton meeting.

Activity 3. Intermediate Structuring Session

The second stage in the development of a normative model of environmental education involved a group session held in Dayton from 30 April - 3 May 1978.

While Walter Bogan (Office of Environmental Education) attended the meeting as an observer, the four working groups were represented by:

Aleco Christakis Kazuhiko Kawamura	Battelle
Raymond Fitz, S.M. Joanne Troha Lorna Wallick	University of Dayton
Robert Waller	University of Northern Iowa
John Warfield	University of Virginia

Raymond Fitz served as leader for the two-and-a-half day session.

John Warfield described as one of our tasks the development of a sound, common language that adequately conveys our meaning with respect to environmental education. The agenda accepted by the group called for an equal amount of open discussion and more structured activity (i.e., a group ISM exercise to construct a normative model). Results of the discussion and clarification of terms were carefully documented and later used in the final integration done by the UD staff.

The intermediate session opened with a progress report from each team on Parts 1, 2, and 3 of the project. The preliminary normative maps were all posted and each team described its approach and major conclusions. As a result, some common problems with the master element list were raised. The group also began a list of definitions for some of the more ambiguous terms. Battelle's distinction between the words "assess" and "evaluate," for example, was particularly useful during the rest of the session. Where "evaluation" can be applied to a past occurrence, "assessment" adds a future perspective, i.e., an examination of alternative courses of action or anticipated outcomes.

The initial discussion also helped orient the entire session; the element list illustrates the range of ideas that exist in the area of environmental education. The purpose of the project is to improve understanding of the terms

and to clarify the relationships that already exist. We need to create little, but rather come to a better understanding of what has evolved -- in other words, "to pull environmental education together." We need to clarify our perception of the philosophy behind what is done in environmental education, that is, how the philosophy relates to policy, and how policy relates to decisions about environmental education in the schools and the community. A normative model tries to capture that philosophy.

After the preliminary maps were analyzed and compared, the Combined Working Group turned to creating a revised normative model of environmental education. The master list, with the UD amendments, was used to begin the exercise. New elements were created where the Group felt necessary, and definitions were recorded to reflect the Group's common understanding of the elements. The Group expressed particular concern about the importance of a uniform interpretation of terms, such as "technical assistance" and "teacher preparation." John Warfield and Walter Bogan helped by providing background information on the source of elements.

The elements structured during the integrative session were chosen to give a cross-sampling of the master list. Ambiguous elements were also chosen for the exercise to give the Group an opportunity to reach a consensus on them and to provide the UD team with a basis for completing the model. The relationship used for this exercise was: "Should Element A logically precede Element B in the first iteration?"

At the end of the intermediate session, twenty-two elements had been incorporated into the integrated model (Figure 2). A grouping of learning outcomes appeared at the top of the map. The Group described the grouping of elements at the bottom as program planning, or "the activities needed to provide a framework or context for environmental education." Included in this context were the core

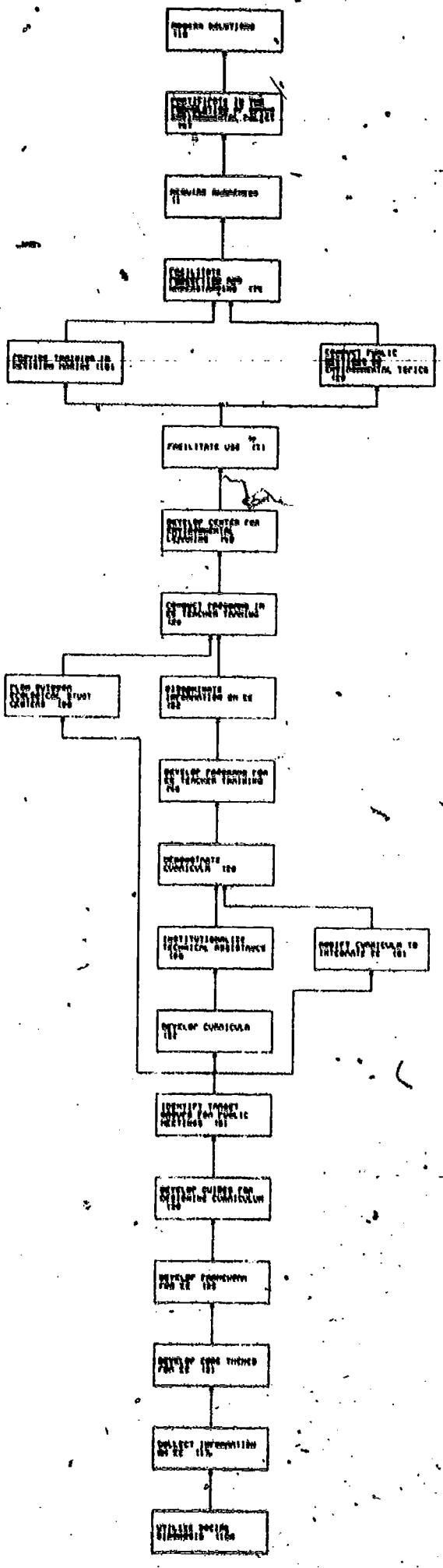


Figure 2. Combined Working Group's Normative Model

themes, collecting information on environmental education, and social diagnosis/ prognosis.

Activity 4. Producing an Integrated Model

The first step taken by the University of Dayton working group following the meeting of the Combined Working Group was to review the entire element list to ensure uniformity of definitions used throughout, so that they would be consistent with the terminology arrived at by the Combined Group. We also added new elements suggested by the group discussion, particularly learning outcomes. We assigned each element to one or more category, such as curriculum development, personnel development, learning outcomes, etc.

Using the structure created by the Combined Working Group and the relationship "Should Element A logically precede Element B?" to start with, we added about one-third of the remaining elements to the model. Logical groupings of the elements began to emerge at this point, which suggested a change in tactics. The relationship of logical precedence had allowed us to create a hierarchical structure with a time flow. However, there was a need recoghized by all the working groups for cycles or feedback, which "logical precedence in the first iteration" does not permit, so we changed the relationship to "Should Element A help achieve Element B?" which does permit cycles and feedback.

By the time about 60 elements had been structured into the model, subsets of the larger model began to emerge. These subsets were groups of like activities or mutually supportive activities, such as planning, personnel development, and learning system design. We structured the remaining elements into the appropriate subsets, and then integrated the subsets into the larger model. The subsets gave us insight into the total model, and the total model suggested changes in the subsets. We completed the normative model by working from the larger model to the smaller ones and vice versa.

During the entire process, we checked questionable relationships by referring to the various working groups' interpretations as embodied in their preliminary maps. When the model was complete, we examined it for consistency and coherence, and distributed a report to the prime and subcontractors describing the process used to create the normative model and some implications as perceived by the UD group.

Activity 5. Feedback from Contributors

The draft report on the normative model discussed some implications of the model with respect to Bloom's Taxonomy of Educational Objectives and Joyce and Weil's Models of Teaching. The concepts in these books suggested interpretations of the model that the UD group found useful; however, all educators do not agree on the utility of those concepts or even know of them, and we were persuaded that such a discussion was premature -- several other project tasks must be completed before implications can be seriously discussed.

The first meeting of the Advisory Committee at Battelle's Columbus Laboratories on 15-16 June 1978 provided further opportunity for comment on the normative model and the draft report. The Advisory Committee's reaction to ISM reminded us that persons who are unfamiliar with the method and who have not participated in structuring a particular model do not find an interpretive structural model very illuminating. On the other hand, John Warfield, Walter Bogan, and the other subcontractors expressed satisfaction with the general structure of the model (if not with the precise placement of the elements). Since the report is intended as an internal document for use by persons knowledgeable about ISM, we elected to make only those changes that clarify the model, and not to make extensive revisions in the graphic manner in which the model is presented. We recognize such a revision would be required if the report were to be broadly disseminated.

Activity 6. The Final Normative Model

One difference between the earlier integrated model and the one presented herein is that the subset "Delivery Systems and Support" has been expanded to include several "institutionalize" elements. Three elements have been added to the evaluation subset to take into account formative and summative evaluation. A suggestion made at the Advisory Committee meeting prompted us to reword the learning outcomes by removing the word "learner." In making this change, we saw an opportunity to clarify societal learning outcomes and individual learning outcomes. This distinction has now been made on the final normative model.

III. An Explanation of the Normative Model

An Interpretation of the Environmental Education Act

The purpose of creating this normative model is to display graphically what educators, legislators, and researchers have said environmental education should be, so that the expectations can be criticized, and improved goals and objectives can be formulated and put into action.

We do not suggest that existing environmental education activities are being carried out in a void. On the contrary, Congress recognized in 1970, when it passed the Environmental Education Act (Pub. L. 91-516, 20 U.S.C. 1531-1536), that there were important environmental issues in our national and international future that the present learning system did not adequately address. In passing the law, Congress set in motion a process whereby the educational community and others could discover, define, and realize learning outcomes relevant to environmental issues; develop the curricula needed to achieve these outcomes; and modify the present learning systems to incorporate these curricula.

The components of learning systems are illustrated in Figure 3. A learning system refers to a particular structuring of human activities that is designed to facilitate the process of learning. In a learning system, the interactions of learners, teachers, and supporting personnel are structured by specific organizational and institutional arrangements. These arrangements are designed to identify learning outcomes, to mobilize needed resources, and to foster the activities needed to realize these learning outcomes.

This definition of learning systems covers both formal education and community education. The Act is clearly intended to foster citizen awareness of environmental problems and knowledge adequate to solve those problems. Consequently, training programs for environmental educators are not restricted to

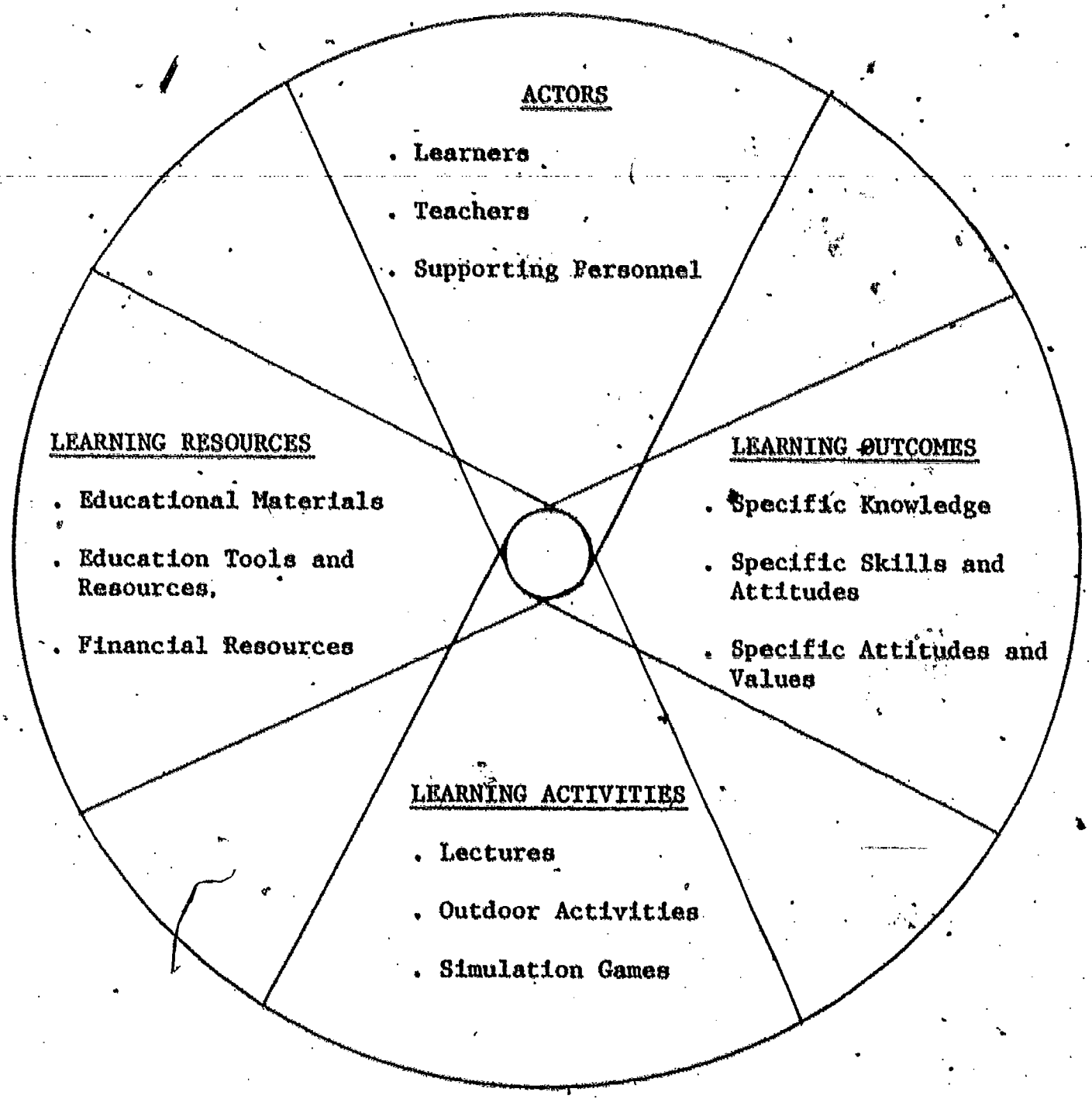


Figure 3: Learning System Components

teachers alone, but include other educational and public service personnel, community, business, and professional leaders, and government employees at local, State, and Federal levels. This provision clearly recognizes that environmental education can take place in contexts other than the formal classroom, and that those contexts are, at present, under-utilized.

In terms of environmental education, then, changes are called for in each of the four components of learning systems. Learning outcomes appropriate to environmental education differ in content and complexity from learning outcomes appropriate to traditional disciplines. New activities must be matched to the desired environmental learning outcomes, and new resources must be identified and developed. Finally, the actors must be equipped with skills to apply the resources and activities toward the learning outcomes.

The Environmental Education Act outlined desirable characteristics for environmental learning outcomes, activities, resources, and actors. The effect was to set into motion an evolutionary process in which new ideas about environmental education can be discovered and developed. The Act provided that innovative and improved curricula be developed, pilot-tested, and disseminated at levels from pre-school to adult education. The underlying assumption was that there are already environmental learning systems, both formal and informal, operating in the community.

It can be said that the Environmental Education Act outlines the content, educational processes, and target groups to be incorporated into the modified learning systems, and the means by which the learning systems will be modified. Consequently, the Part 3 model attempts to capture the normative logic or structure of the process for modifying present learning systems so that environmental concerns are incorporated. It also structures some of the target groups, content, and processes to be incorporated into the modified system. In summary,

the normative model describes desirable characteristics of the modified learning systems and how to guide these modifications. In other words, the normative model is a management framework for environmental education.

Overview of the Normative Model

This section is a discussion of the finished normative map produced by the University of Dayton group. The ideas contained in the map come from four sources: the preliminary maps created by the working groups at the University of Northern Iowa, Battelle, the University of Dayton, and by the University of Virginia graduate students; the structure produced and the discussion that accompanied its production in the integrated modeling session at UD on 1-3 May; the interpretations made by the UD staff of elements that the Combined Working Group had no opportunity to model and that were left to UD to add to the initial structure; and changes made as a result of conversations with the prime and subcontractors, Walter Bogan, and the Advisory Committee.

The elements came from three sources: the initial list for Part 3 provided by John Warfield; the elements created by the Combined Working Group on 1-3 May; and new elements created by the UD staff as needed to produce a coherent normative structure. For example, there was an element "Plan an outdoor ecology center," but there was no element "Build an outdoor ecology center," so one was added.

All of the elements in Warfield's list have either been modeled and appear on the map, have been combined with another element, or have been eliminated from the model. Appendix A contains a complete list of all elements, with notes on their sources and on their disposition if they do not appear on the map.

The size of the element set led to a very large normative model (Figure 4) that is folded in the pocket on the back cover of this report. For purposes of

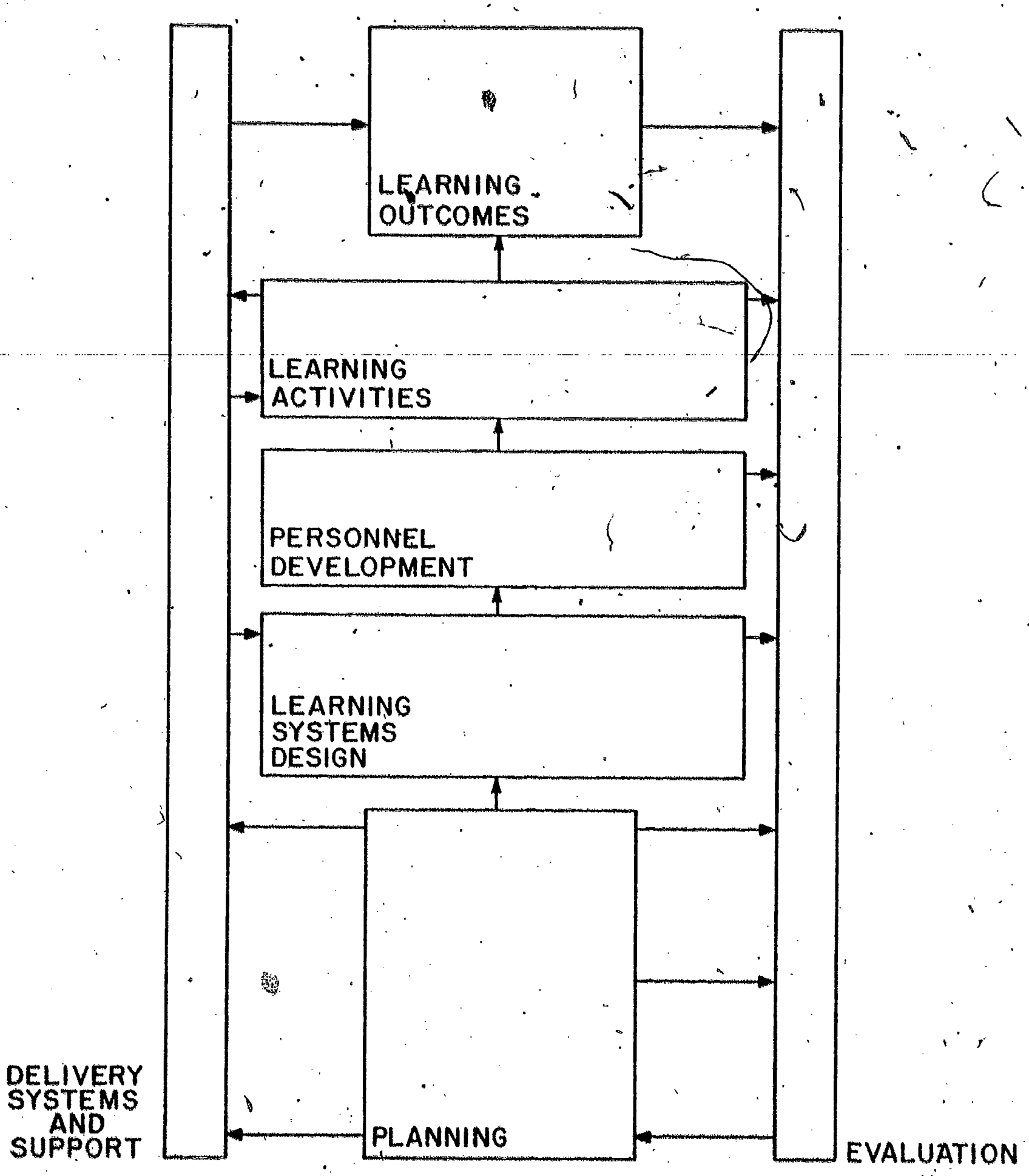


Figure 5. Schematic of Normative Model Showing Superstructure

discussion, the model can be visualized as several subsets of related elements. This "superstructure" is indicated in Figure 5. The following section will discuss the superstructure, then each of the subsets individually; the discussions will be accompanied by figures taken from Figure 4 and enlarged to show details or "mini-structure."

The Combined Working Groups used the relationship "Should Element A logically precede Element B in the first iteration?" The "logical precedence" relationship gave the model a time flow and hierarchical structure from which to start. The model was then transformed by the UD working group to a model using the relationship "Should Element A help achieve Element B?" This was accomplished by adding appropriate feedback loops, such as from evaluation elements to planning, and by putting into cycles elements that would have "synergy" by being carried out together. Therefore, elements at the bottom of the finished model lend support to all elements above them in the structure, and thus can be said to logically precede them. However, there were two sets of elements (activities) that are carried out at many levels and are best illustrated as continuous processes. These are the activities of dissemination and support, and of evaluation. Therefore, the long vertical rectangle at the left of the model represents ongoing delivery systems and support, and that at the right of the model represents ongoing evaluation.

It is worth repeating that the structure of the normative model was not something that we conceptualized in advance, but something that evolved as a result of our modeling sessions using ISM. We realized that we were dealing with various types of elements, and the method helped us sort and organize them into what now represents a reasonable management framework for implementing the Environmental Education Act.

Major Subsets of the Normative Model

The elements sorted nicely into seven functional groups:

- Planning lies at the base of the map and sets into motion the development of core themes, funding and institutional support.
- Learning Systems Design is largely concerned with developing and modifying curricula and community education approaches to meet environmental education objectives.
- Personnel Development provides for training of teachers and community education facilitators.
- Learning Activities is the actual conduct of programs laid out in Learning Systems Design.
- Learning Outcomes is the realization of the various environmental education goals set forth in the Act and elsewhere.
- Delivery Systems and Support includes activities that will institutionalize environmental education and provide for dissemination of newly developed materials and approaches.
- Evaluation, like delivery systems and support, is a continuing set of activities that intermesh with the five central subsets.

Each of these subsets is discussed in detail in the following pages.

Planning

The activities at the base of the model (Figure 6) are planning activities that address both the formal and community education sectors. The elements "Collect data on EE (125)" and "Collect information on EE (17)" take into account the fact that environmental education already exists in the USA and that future plans should be based on information about the present system; both are supported by Element 118, acquire skills in data collection. Once the present status of EE is known as a result of data and information collection, future EE activities (9) and appropriateness of EE content (10) can both be assessed. At the same time, social diagnosis and prognosis (109) come into play, so that environmental education is consistently integrated into the larger context of man's total environment. Social diagnosis and prognosis insure that environmental education is always responsive to present and anticipated

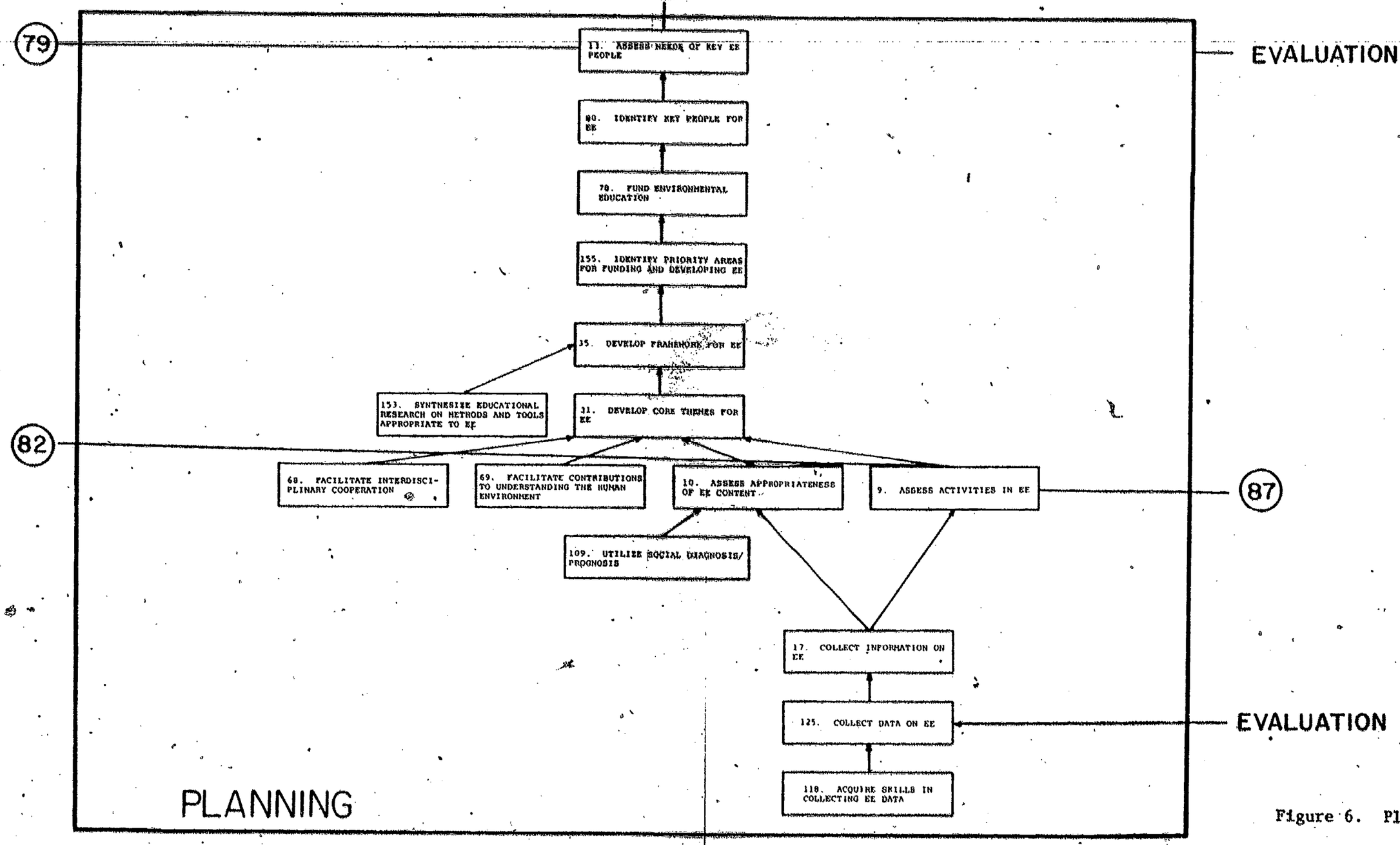


Figure 6. Planning

A → B

ELEMENT A SHOULD HELP ACHIEVE ELEMENT B

environmental problems.

With cooperation of persons in all disciplines (68), core themes (31) and an integrated framework (35) for addressing core themes can be developed. Core themes are one way to conceptualize the content of environmental education so that it is not restricted to a traditional disciplinary approach, but lends itself to multidisciplinary treatment. A framework for environmental education would relate core themes to educational methods appropriate to specific age levels. An integrated framework can ally core themes with educational theory so as to provide an approach to problem-solving and multidisciplinary learning. Clearly, Element 35, develop a framework for EE, is a key dimension of planning that is supported by Element 153, synthesize educational research on methods and tools appropriate to EE, and Element 31, develop core themes.

It then remains for funding areas to be assigned priorities (155), for funding to be sought outside school-related organizations (78), and for key people to be identified (80). Elements 80 and 13 are concerned with all persons upon whom successful institutionalization of environmental education depends, from the students and general public to whom information will be transmitted, to the teachers and community EE facilitators who will assist in information transfer, to the administrators and intermediary agencies (such as universities and state agencies) upon whom the teachers and facilitators depend for support and training. Taken collectively, the planning elements provide for a continuation and improvement of existing environmental education efforts, and an expansion into new and desirable areas.

Learning Systems Design

Planning supports the design of learning systems for the formal education sector and for community education. The elements to the right of Figure 7, Learning Systems Design, represent steps to develop new curricula (32), to

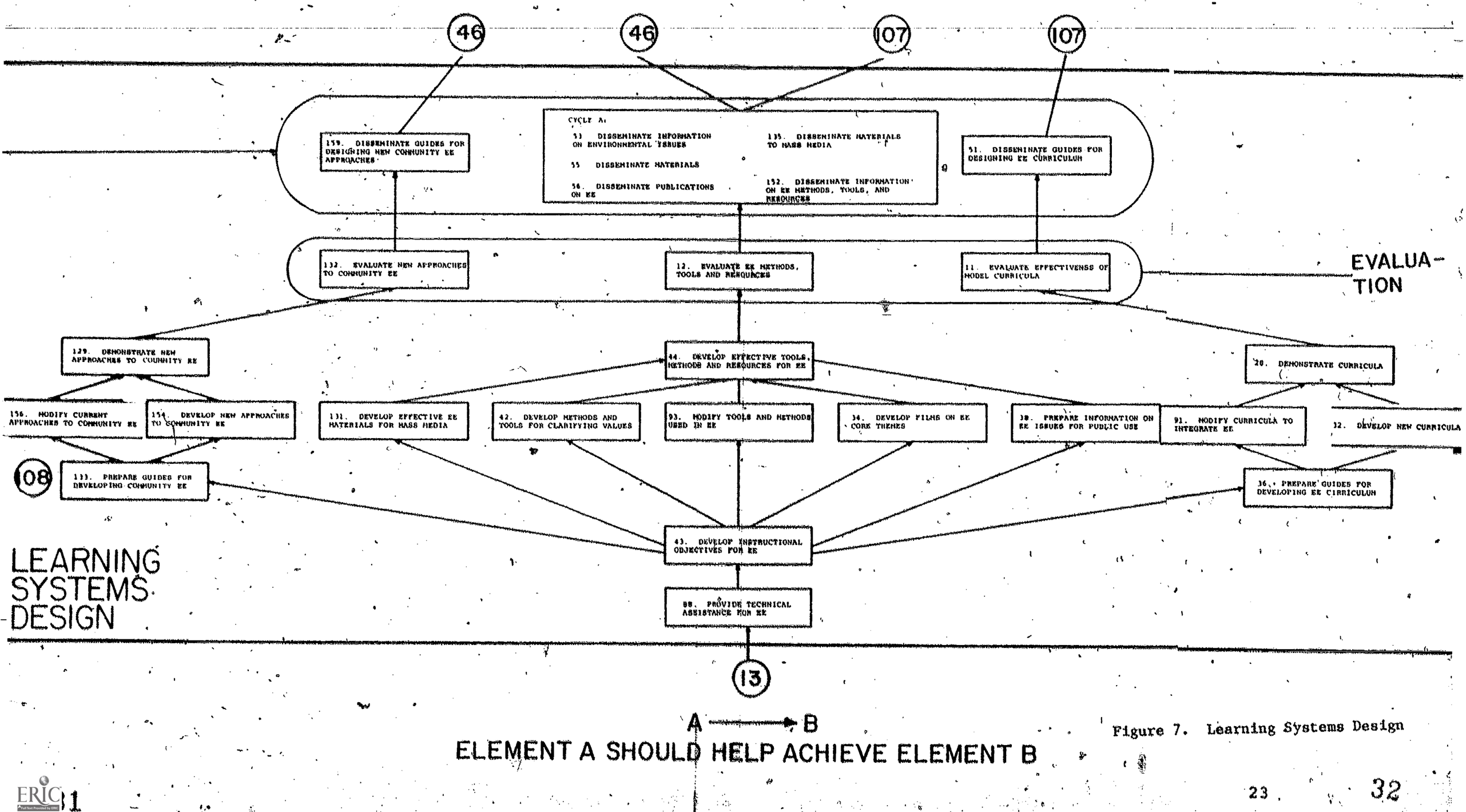


Figure 7. Learning Systems Design

modify existing curricula (91), and to demonstrate the new curricula (28). There is no word that corresponds in the community sector to the concept of curriculum, yet the Combined Working Group agreed that a similar set of activities aimed at transmitting information and altering attitudes toward the environment could be designed for community education purposes. For lack of a better term, we called these activities "new approaches" to community environmental education, and their development (154) and demonstration (129) appear at the left of Figure 7. In the center of the figure are elements concerned with the development of tools, methods, and resources that are not curriculum per se, but are used in conjunction with curriculum and community education approaches.

Element 43, develop instructional objectives for environmental education, supports all the activities involved in designing and demonstrating learning systems. The entire subset and all those above it are supported by Element 88. Learning systems design cannot proceed without provision of technical assistance (88).

Having demonstrated new curricula (28), new approaches to community education (29), and new tools, methods, and resources for both sectors (44), they are evaluated prior to their dissemination (11, 132, and 12, respectively). Promising developments can then be given further support, successful approaches should be disseminated, and failures can be reported so further resources will not be expended on them. Evaluation, then, requires a feedback loop to the Planning subset to introduce the results of the evaluation in future planning (refer to Figure 5).

Personnel Development

Figure 8 shows the structure of the personnel development subset. With new educational materials available, new training programs are called for so that teachers and community EE facilitators can be equipped to use them.

PERSONNEL DEVELOPMENT

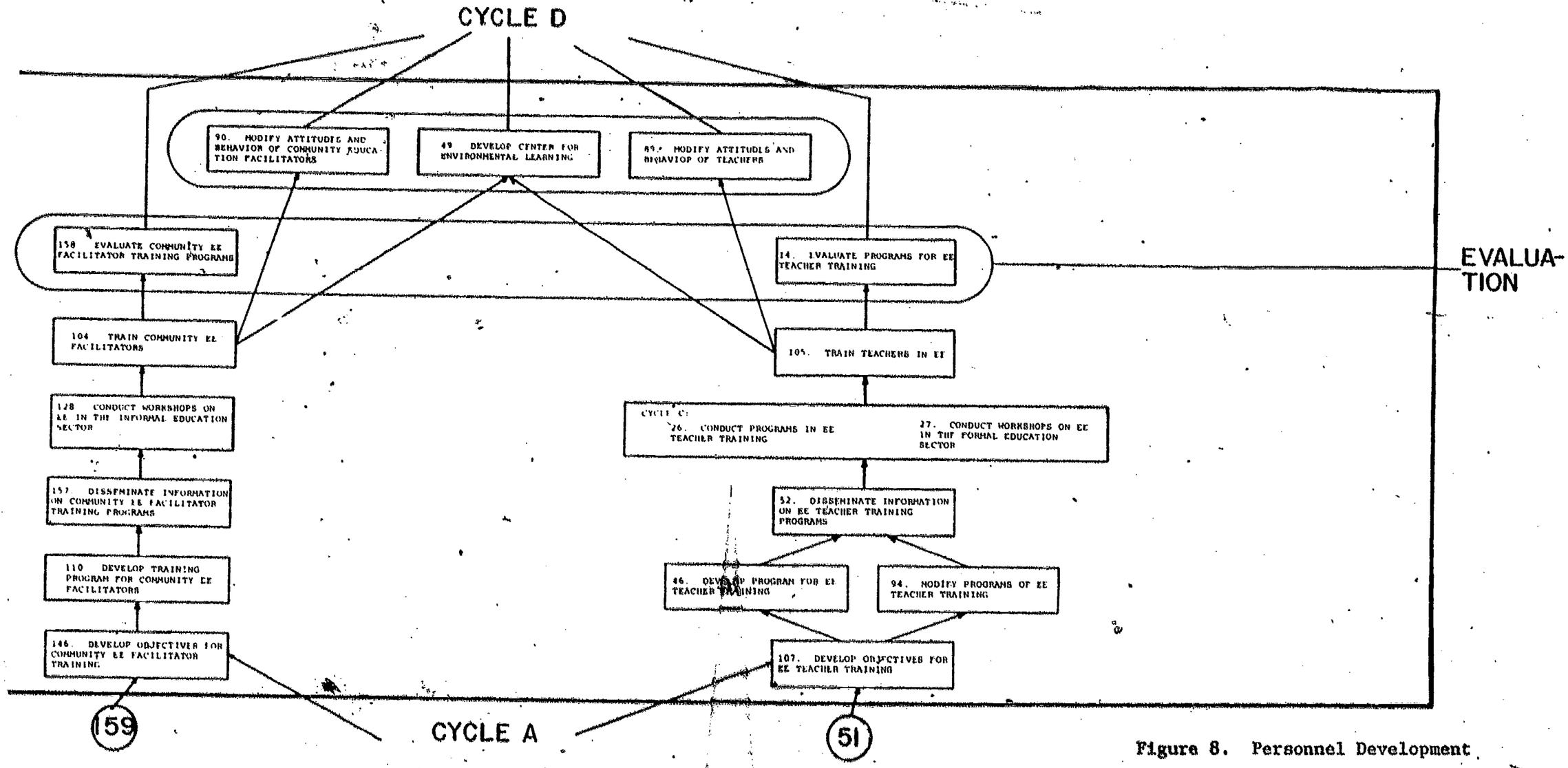


Figure 8. Personnel Development

A ⟶ B

ELEMENT A SHOULD HELP ACHIEVE ELEMENT B

(Community education facilitators include the community counterpart to teachers, such as park naturalists and museum personnel, but they are not limited to these. Persons who assume an active role in community programs whose intent is not primarily education may also be included. Private club and organization members, for instance, are likely to act as community education facilitators.)

The first step in personnel development is to set objectives for the two types of training programs (107 and 146). Setting objectives supports the development of new programs (46 and 110) and the modification of existing programs (94). Information on training programs is disseminated (52 and 157), supporting the actual conduct of the programs themselves (26). Workshops (27 and 128) are envisioned as the most common, but not the only method, for teaching teachers and facilitators new methods for environmental education (104 and 105). As with the design of the learning systems, a personnel development program should be followed by evaluation activities (14 and 158) that will in turn influence planning for future programs. Two desirable outcomes of personnel development, besides the educators' competency with new methods, should be a change in their attitudes and behavior (89 and 90) toward environemental education. Subsequent to the personnel development efforts should be the development of a center for environmental learning (49) that should support the learning activities to follow.

Learning Activities

At this point, the activities of program planning, learning system design, and personnel development all support what is commonly thought of as education, namely, learning activities. A cycle of activities that are mutually supportive underlies the subset of learning activities (Figure 9). The teacher training programs discussed earlier should facilitate effective use of EE materials and practices (71) and should facilitate involvement of the formal education system

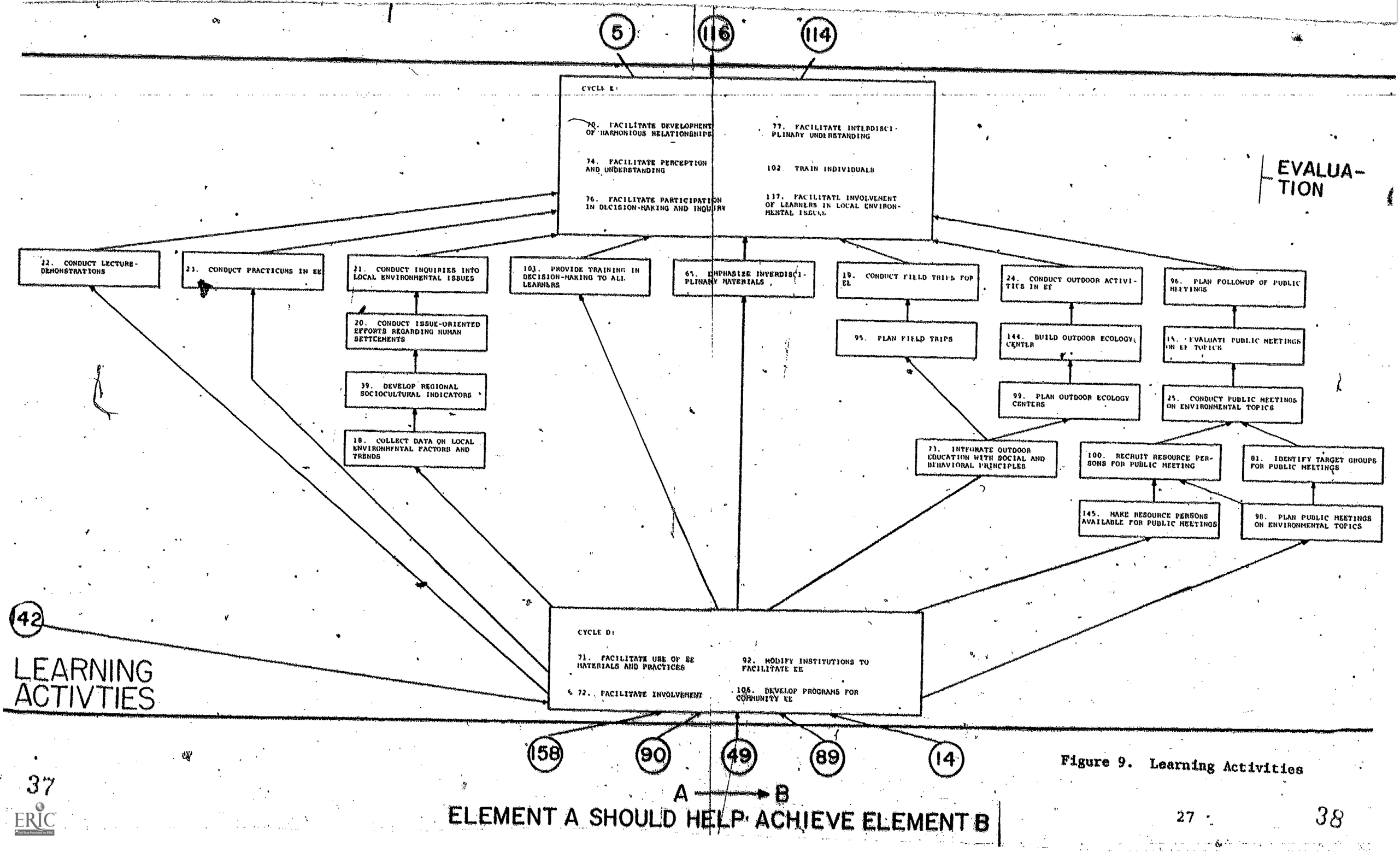


Figure 9. Learning Activities

in community education programs (72). Development of programs for community environmental education (106) is supported by effective use of EE materials and practices. These three elements help to modify institutions to facilitate environmental education (92) and at the same time are supported by the modifications.

The learning activities modeled in Figure 9 are largely conducted by the teachers or by the community EE facilitators. The activities are not new or unique to environmental education, but in EE's normative future, they would be better designed and executed, with more careful consideration given to their EE content, and they would be conducted by people who are better equipped to evaluate their results in terms of learning outcomes. For example, much of our current environmental legislation calls for public input to the decision-making process that usually takes the form of a public meeting. At present, these meetings are often carried out as a burdensome duty; public attendence is low due to poor publicity and lack of interest in the topic among the potential attendees; it is difficult to recognize if and to what degree the public input solicited has been taken into account by the authorities, or if the attendees are any better informed as a result of their attendence. In this normative conceptualization of environmental education, more planning would go into public meetings (98), more careful attention would be paid to the target group for the meeting (81), the results would receive a genuine evaluation (15), and more effort would be expended to assure a continuing involvement of the attendees in terms of follow-up action (96).

The elements named as learning activities are not restricted to either the formal or community sector. Lecture-demonstrations (22), field trips (19), practicums (23), and inquiries into local environmental issues (21) are activities that could be put to good use in both sectors. Outdoor ecological centers (144) are especially adaptable to a broad range of activities (24) for

school children as well as for the general public. Even public meetings aimed at an adult audience can be attended by students in the formal sector as part of their curriculum.

A particularly important element in this subset is Element 101, provide training in decision-making to all learners. After all, one major intention of environmental education is to equip citizens with the information and skills they need to make sound decisions about their environment. An emphasis on interdisciplinary materials (65) at the same time as the training in decision-making should help accomplish this objective. In the normative future, students of the environment, be they children or adults, will derive their knowledge from real-world studies of their local environment (20) and will also make contributions to that knowledge. Such contributions will include collection of data on local environmental issues (18), and development of regional socio-cultural indicators based on those data (39).

The net result of all these learning activities will be the realization of six mutually supportive objectives of environmental education:

- facilitate participation in decision-making and inquiry (76)
- facilitate interdisciplinary understanding (77)
- train individuals to work from a holistic frame of reference concerning the environment (102)
- facilitate perception and understanding (74)
- facilitate development of harmonious relationships between the individual and the environment (70)
- facilitate involvement of learners in local environmental issues (137)

The notion "to facilitate" is difficult to define and to measure (i.e., in order to know that the action has actually been accomplished), yet the Combined Working Group agreed upon its importance in the normative model and its role in supporting the important learning outcomes that appear above this level in

the model.

Learning Outcomes

One reoccurring problem that arose during the various modeling sessions was the question of who will be carrying out the activities named in the list of elements. In order to avoid confusion on this important point, the UD working group made a series of elements that could positively be recognized by any reader as actions the learner would take. For the most part, these learning outcomes are derived from elements already in the element set; others were originated by the UD working group during their modeling sessions.

The result of structuring the learning outcomes using the relationship "should support" was a hierarchy of educational goals and objectives, as shown in Figure 10. Individual learning outcomes appear at the base of the subset, lending support to societal learning outcomes at the top of the entire model.

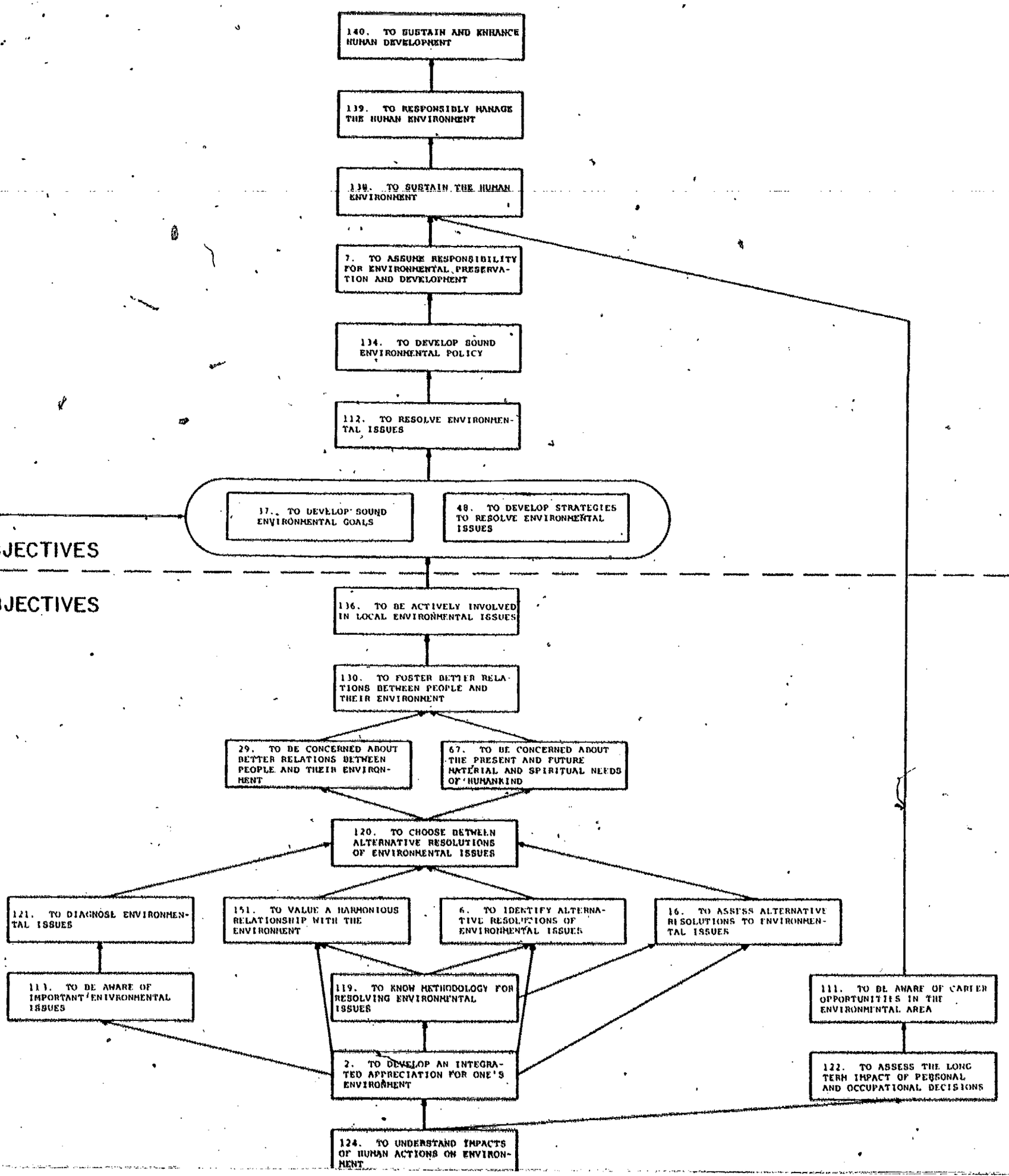
The facilitation and institutionalization activities of the previous levels support three basic skills in environmental education: the learner's ability to analyze complex systems (5), to synthesize concepts from many different disciplines (116), and to know environmental concepts and principles (114). These learning outcomes are basic to the rest of the structure. Each of them supports each of the four outcomes in the next level. An individual should then be able to situate environmental issues in the next larger context (123) and to acquire skills in data collection on environmental issues (148). He should also be able to identify important elements of the environment (149), and to structure the elements into coherent patterns (150).

These four elements support Element 3, to acquire insights for environmental analysis. The learner can then turn these skills to more specific aspects of the environment, such as linkages among local, national, and international issues (8). This outcome is also supported by Element 4, to be

DELIVERY SYSTEMS AND SUPPORT

SOCIETAL LEARNING OBJECTIVES

INDIVIDUAL LEARNING OBJECTIVES



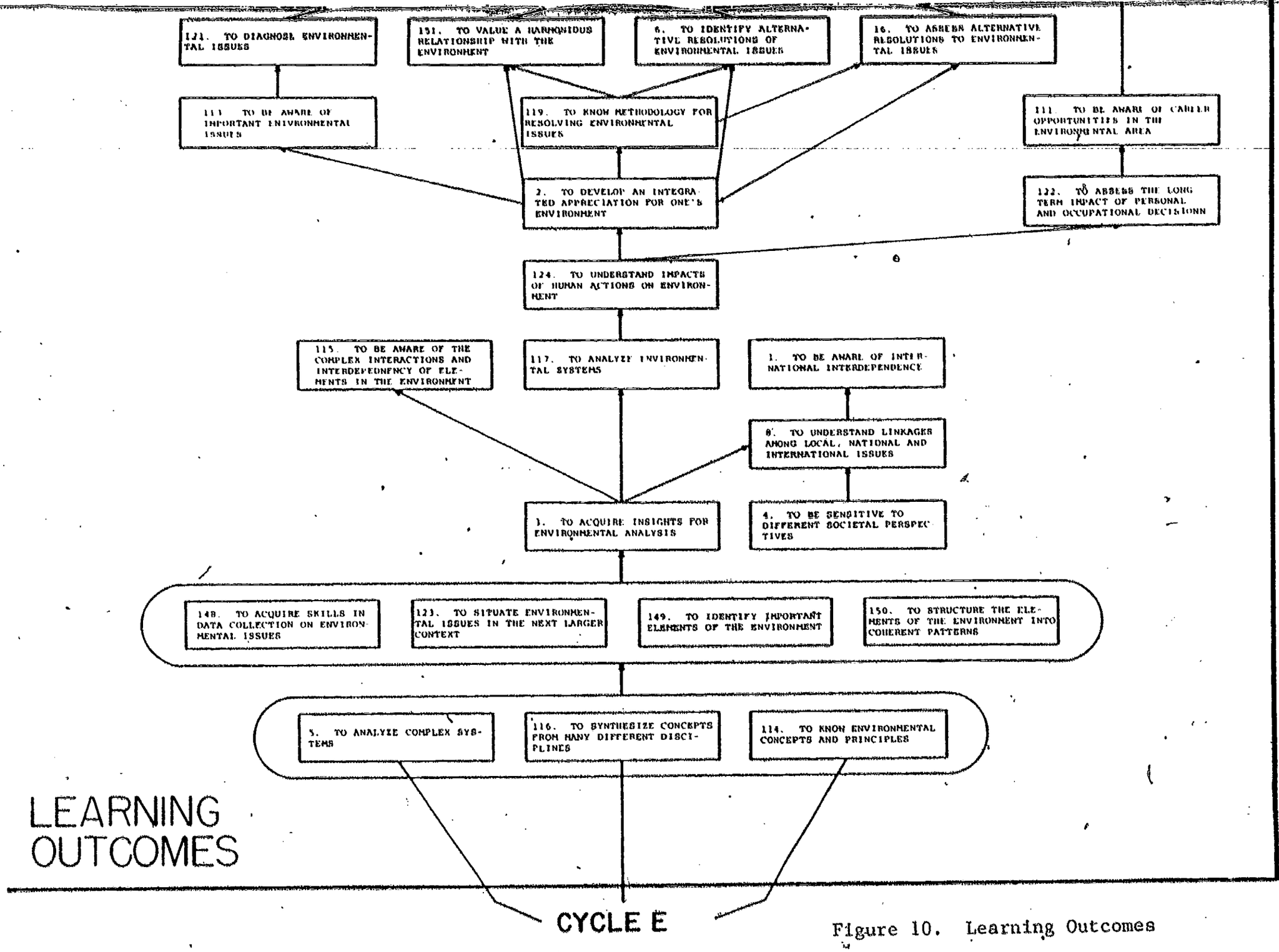


Figure 10. Learning Outcomes

sensitive to different societal perspectives. The learner's insights into and recognition of linkages and societal perspectives support an awareness of international interdependence (1). When an individual can analyze environmental systems (117), and is aware of interactions and interdependencies, he can understand the impacts of human actions on the environment (124), and will develop an integrated appreciation for his environment (2). At the same time, an individual's ability to analyze human impact on the environment will support his assessment of long-term impacts of personal and career decisions (122). This, in turn, may influence his awareness of career opportunities in the environmental area (111).

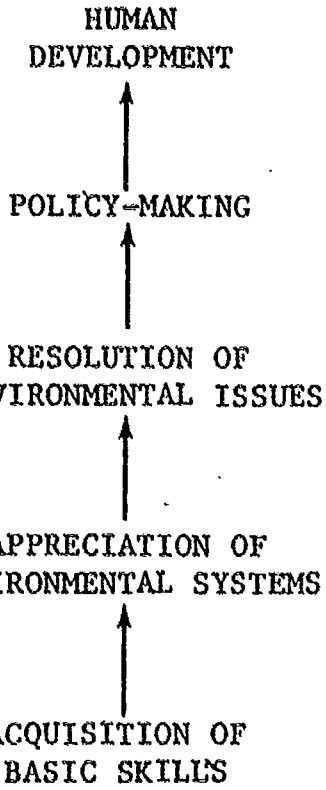
Element 119, to know methodology for resolving environmental issues, is required before an individual can identify alternative resolutions of environmental issues (6), assess those alternatives (16), diagnose environmental issues (121), or value a harmonious relationship with the environment (151). A learner should also be aware of important environmental issues (113) before he can diagnose them.

These abilities to recognize and diagnose environmental issues and to identify and assess alternative solutions support a very important activity, Element 120, to choose between alternative resolutions of environmental issues. This ability supports and will be reflected in two concerns: for better relations between people and their environment (29), and for the present and future material and spiritual needs of humankind (67). Such concern supports a willingness to create better relations between people and their environment (130). This willingness to act paves the way for societal action, namely, the development of sound environmental goals (37) and strategies to resolve environmental issues (48). Elements 37 and 48 support Element 112, to resolve environmental issues, which in turn supports Element 134, to develop sound

environmental policy. Sound policy supports a responsibility for environmental preservation and development (7).

Career opportunities (111) and a responsible attitude (7) lead to responsible action to sustain the human environment (138). This action is manifested as responsible management of the human environment. Society, or the collective learners, can then sustain and enhance human development (140).

The organization of the learning outcome hierarchy is clear, and it can be seen in the diagram below, where the arrows represent "supports."



Delivery Systems and Support

Once initial planning efforts have taken into account past environmental education efforts and set in motion a modified and improved approach to environmental education, there is a need for continued analysis of progress (82) that goes beyond planning and persists throughout the other subsets of the model. Since this and the other elements in the delivery systems and support subset must operate throughout the process, they are contained in a continuous bar at the left of the model (refer to Figure 5 and Figure 11). The role of the

Delivery Systems and Support activities is to insure a smooth interface between the other major subsets of the normative model. These interfacing activities insure that there is a smooth flow of information, innovative ideas, and educational methods and materials from one subset to the others.

At the conclusion of learning systems design in the normative model, a number of items are available for dissemination. These include guides for designing new curricula (51) and new approaches to community environmental education (159), as well as other teaching materials (55, 56, and 152), materials for the mass media (135), and general information on the environment (53), all from Learning Systems Design. The availability of these materials lends support to the teacher training activities that follow, the learning activities conducted in the classroom and in the community at large, and the eventual realization of the learning outcomes desired for environmental education.

Successful dissemination depends on the prior identification of dissemination mechanisms (79) suitable for the target audience, prior planning to incorporate environmental education into the education system (97), and the development of a delivery system for environmental education (33). Then, having selected the larger target group, specific teachers and community EE facilitators can be identified as recipients for newly developed materials (108).

Besides individual teachers and community education facilitators, there are many groups that perceive themselves as having an educational function. Some have obvious interests in the environment; others are more community or professionally oriented, but in either case, they should be enlisted for (or at least informed about) roles they could play in newly designed approaches to environmental education (75).

As learning activities are about to commence, two elements are critical to successful, ongoing environmental education. They are: educate key

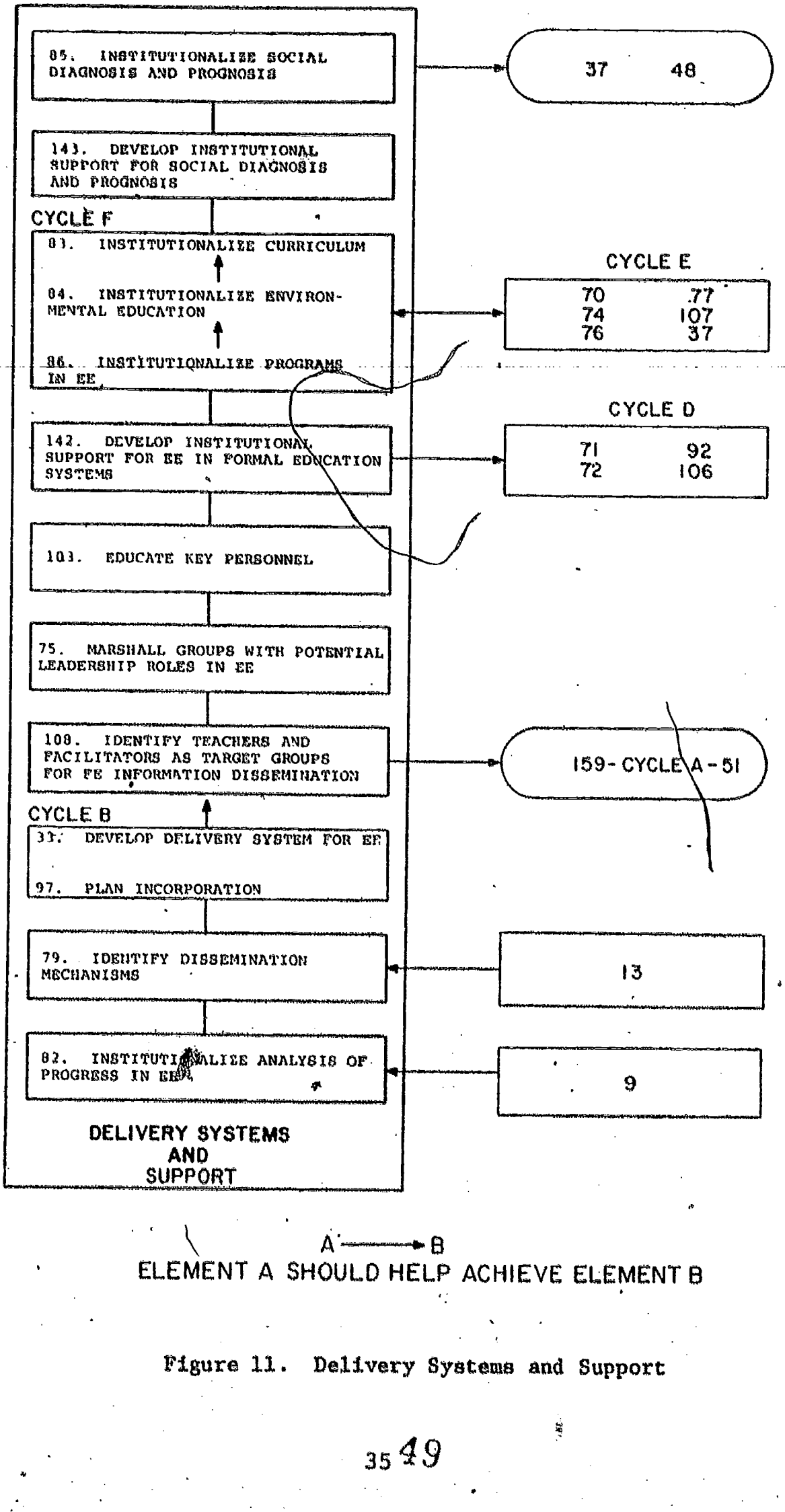


Figure 11. Delivery Systems and Support

personnel regarding core themes and the rationale for EE (103) and develop institutional support for environmental education in formal education systems (142). Well-prepared teachers and community EE facilitators will be unable to implement new curricula and approaches to community education if such support from administrators and institutions is not forthcoming. This support is important at all levels of the model, but is especially critical at the point when new programs are to be put into action or when existing programs are to be modified.

Once learning systems have been designed, personnel trained, and learning activities begun, institutionalization of curriculum (83), EE programs (86), and the concept of environmental education (84) become important to the maintenance of a continuing system and to one another. Like the "facilitation" elements to which they are directly connected, institutionalization is hard to define and hard to measure. However, the Combined Working Group agreed that it means to guide a social process through the creation or modification of norms, roles, and activities, and not necessarily to create a new institution or organization.

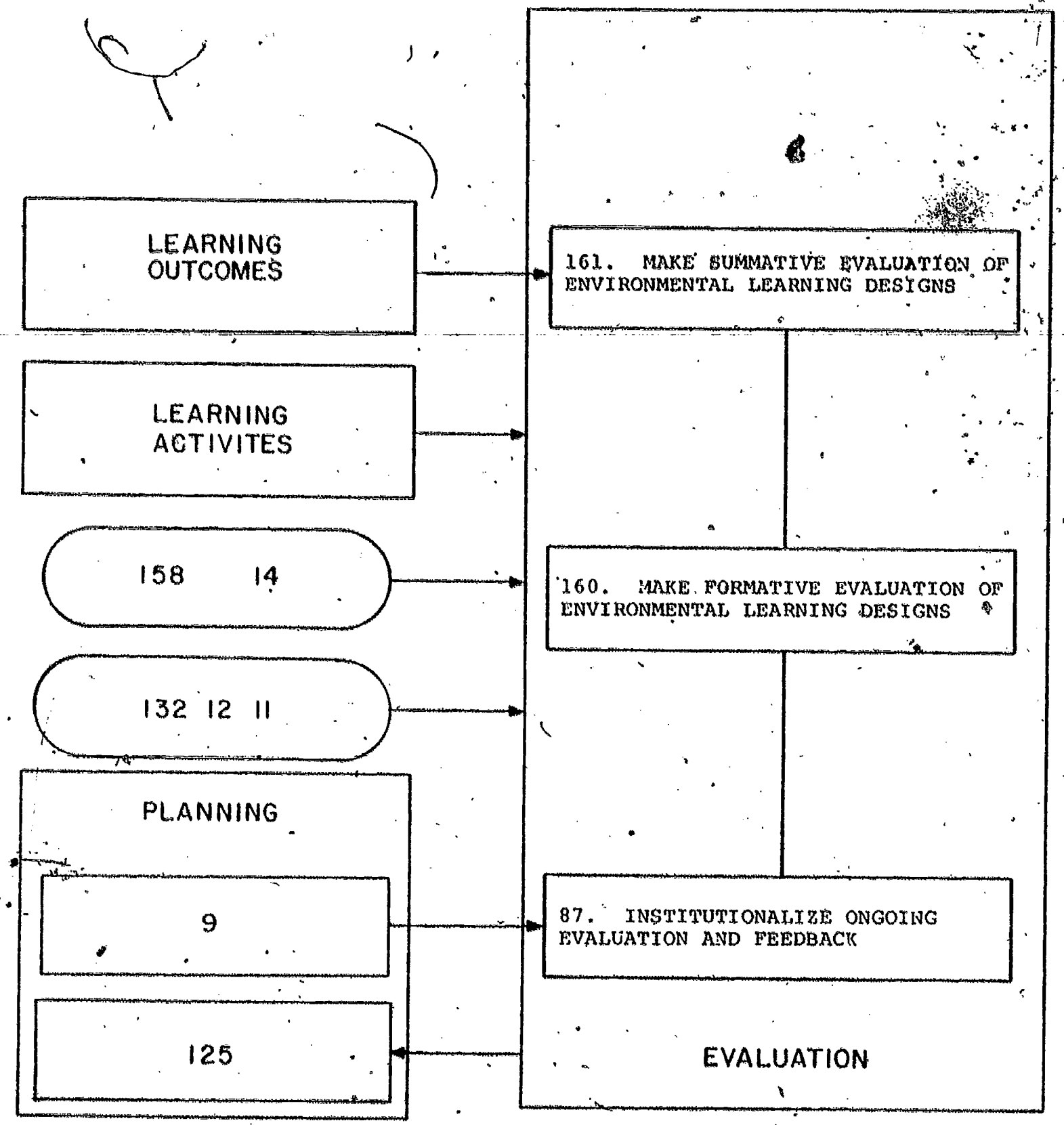
For instance, Element 143, develop institutional support for social diagnosis and prognosis, and Element 85, institutionalize social diagnosis and prognosis, are not intended to mandate a new Agency for Social Diagnosis and Prognosis, complete with office space and staff. Rather, they are included in the model to indicate that diagnosis of what is right and wrong with the environment and prognosis of what is to come should be a normal state of affairs. The identification of present and future issues can be carried out by formal planning agencies, citizens' groups or students, and in fact, the process of identifying such issues should be and can be made part of environmental education. The knowledge gained will then support Element 37, develop sound environmental

goals, and Element 48, develop strategies to resolve environmental issues.

Evaluation

Evaluation is better represented as a continuing process than as a set of elements, thus its appearance as a long rectangle at the right of the normative model with input from all the other subsets (refer to Figure 5). There are other evaluation elements in the model besides the three contained in the rectangle (Figure 12), but they are very specific evaluation activities tied to specific elements, such as Element 11, evaluate the effectiveness of model curricula, and Element 158, evaluate programs for training community EE facilitators.

Each evaluation element in the model is connected to the planning subset by way of the evaluation subset, which contains Elements 160 and 161, make formative and summative evaluations of environmental learning designs. At the base of the subset lies Element 87, institutionalize ongoing evaluation and feedback. Consequently, after each subset of activities is a feedback to the planning stages and a step toward institutionalization of the feedback loop. By this process, environmental education can be ever more finely tuned to the needs of the present and the future.



A ⟶ B

ELEMENT A SHOULD HELP ACHIEVE ELEMENT B

Figure 12. Evaluation

Summary

The Part 3 normative model illustrated in Figure 4 is composed of elements that educators, legislators, researchers, grantees, and others have expressed or implied as essential or desirable ingredients of environmental education as it should be. Using Interpretive Structural Modeling, researchers and educators from the University of Virginia, Battelle, the University of Northern Iowa, and the University of Dayton structured the elements into a normative model of environmental education.

The "skeleton" structure of the model can be taken as a management framework for implementing and institutionalizing environmental education. Its seven major subsets are: planning, learning systems design, personnel development, learning activities, learning outcomes, delivery systems and support, and evaluation.

With this master scheme set out, the next step is to match the appropriate learning activities, learning resources, and actors with one another to achieve the desired learning outcomes, which collectively are aimed at a mutually supportive relationship between humans and their environment.

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Appendix A

ELEMENT LIST FOR THE NORMATIVE MODEL PRODUCED IN THE INTEGRATING SESSION

TITLE: NORMATIVE MODEL OF ENVIRONMENTAL EDUCATION

DATE REVISED: 27 JUNE 1978

****

* ACTIVITY 1 - ORIENTING THE SESSION *

****

ORIENTING QUESTION:

"HOW WOULD YOU DESCRIBE THE "DESIRED" IMPLEMENTATION OF EE ?"

OBJECTIVES OF THE EXERCISE:

TO PRODUCE A DOCUMENTED NORMATIVE MODEL OF EE

PURPOSES OF THE EXERCISE:

TO EXPLAIN THE DESIRED STATE OF EE IN THE USA

GOALS OF THE EXERCISE:

TO ENHANCE THE QUALITY OF EE IN THE USA

ROLES:

U.D. WORKING TEAM

RAYMOND FITZ, S.M.
JOANNE TROHA
LORNA WALLICK

CONSULTING TEAM

JOHN O. GEIGER, U.D. CENTER FOR EDUCATIONAL SERVICES

COMBINED WORKING GROUP

JOHN WARFIELD, UNIVERSITY OF VIRGINIA
ALEXANDER CHRISTAKIS, BATTELLE
RAYMOND FITZ, UNIVERSITY OF DAYTON
KAZUHIKO KAWAMURA, BATTELLE
JOANNE TROHA, UNIVERSITY OF DAYTON
ROBERT WALLER, UNIVERSITY OF NOTHERN IOWA
LORNA WALLICK, UNIVERSITY OF DAYTON

CONTEXT:

****

* ACTIVITY 2 - SPECIFYING THE ELEMENTS AND THE RELATIONSHIP *

****

GENERATING QUESTION:

WHAT LEARNING ACTIVITIES SHOULD BE PART OF ENVIRONMENTAL EDUCATION ?

WHAT LEARNING OUTCOMES SHOULD BE PART OF ENVIRONMENTAL EDUCATION ?

STRUCTURING QUESTION:

SHOULD ***ELEMENT A*** BE INCLUDED IN ***ELEMENT B***	SHOULD ***ELEMENT A*** SUPPORT ***ELEMENT B***	SHOULD THE ACTIVITY ACQUIRE AWARENESS LOGICALLY PRECEDE THE ACTIVITY ACQUIRE PERCEPTION IN THE FIRST ITERATION ?

KEY TO SOURCE OF ELEMENTS

"ARIZ. *"
REFERS TO THE ARIZONA REPORT. THE ELEMENT WAS LISTED THEREIN AS BEING PART OF CURRENT PRACTICE, AND WAS ALSO INCLUDED IN THE PART 2 ISM LIST.

"TBIL"
REFERS TO THE TBILISI DOCUMENT (IDENTIFIED) IN THE "HISTORY" REPORT.

"EE REGS"
REFERS TO THE ENVIRONMENTAL EDUCATION REGULATIONS, AND SPECIFICALLY TO AN ELEMENT IDENTIFIED FOR THE CHANNEL INN MEETING.

"GRANT"
REFERS TO A PAST OEE GRANT. THE ACTIVITIES CAN BE TRACED BACK TO SPECIFIC GRANTS BY USING THE ELEMENT LIST FOR PART 2, SINCE THESE ELEMENTS WERE FOR BOTH PARTS 2 AND 3.

"HOUSE"
REFERS TO AN ELEMENT ADDED BY DR. HOUSE AFTER EXAMINING THE LIST OF ELEMENTS FROM GRANTS, AND NOTING THAT SOME

LOGICAL MEDIATING ELEMENTS WERE MISSING.

"UVAS"
REFERS TO AN ELEMENT ADDED BY UVA SYSTEMS STUDENTS, WHO ADDED ELEMENTS THAT APPEARED TO BE NECESSARY AS MEDIATING ELEMENTS.

"HARFIELD"
REFERS TO AN ELEMENT ADDED BY HARFIELD BECAUSE IT WAS PRIMARY TO THE STRUCTURING PROCESS.

SUBSYSTEM KEY:

C= CURRICULUM (E.E.) (FORMAL ONLY)
R= RESOURCE
P= PERSONNEL
F= FORMAL EDUCATION
I= COMMUNITY EDUCATION (INFORMAL)
L= LEARNING OUTCOMES
N= KNOWLEDGE
O= COMPREHENSION
Q= APPLICATION
S= ANALYSIS
T= SYNTHESIS
U= EVALUATION
V= RECEIVING
W= RESPONDING
X= VALUING
Y= ORGANIZING
Z= CHARACTERIZATION BY A VALUE OR VALUE COMPLEX

ELEMENT LIST

1. TO BE AWARE OF INTERNATIONAL INTERDEPENDENCE — LFISV

   DERIVED FROM ELEMENT 1.1 IN 4/1/70 LIST (SOURCE: TBIL)

2. TO DEVELOP AN INTEGRATED APPRECIATION FOR ONE'S ENVIRONMENT — LFIST

   DERIVED FROM ELEMENT 1.2 AND 1.8 IN 4/1/70 LIST (SOURCE: EE REGS)

3. TO ACQUIRE INSIGHTS FOR ENVIRONMENTAL ANALYSIS — LFIS

   DERIVED FROM ELEMENT 1.3 IN 4/1/70 LIST (SOURCE: EE REGS)
   -NEEDED TO UNDERSTAND THE STRUCTURE, REQUIREMENTS, AND IMPACT WITHIN AND AMONG VARIOUS ENVIRONMENTAL ENTITIES, SYSTEMS, AND SUBSYSTEMS
   -NEEDED TO UNDERSTAND INTERACTIONS

4. TO BE SENSITIVE TO DIFFERENT SOCIETAL PERSPECTIVES — LFIV

DERIVED FROM ELEMENT 1.4 IN 4/1/78 LIST (SOURCE: TBIL)
-TO DIFFERENCES AMONG SOCIETIES, GROUPS, AND INDIVIDUALS, IN TERMS OF THEIR CONCERNS, GOALS, AND CAPABILITIES

5. TO ANALYZE COMPLEX SYSTEMS — LFIS

DERIVED FROM ELEMENT 1.5 IN 4/1/78 LIST (SOURCE: TBIL)

6. TO IDENTIFY ALTERNATIVE RESOLUTIONS OF ENVIRONMENTAL ISSUES — LFIT

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: EE REGS)

7. TO ASSUME RESPONSIBILITY FOR ENVIRONMENTAL PRESERVATION AND DEVELOPMENT — LFIW

DERIVED FROM ELEMENT 1.7 IN 4/1/78 LIST (SOURCE: TBIL)

8. TO UNDERSTAND LINKAGES AMONG LOCAL, NATIONAL AND INTERNATIONAL ISSUES — LFIT

DERIVED FROM ELEMENT 1.8 IN 4/1/78 LIST (SOURCE: ARIZ. 1.0)

9. ASSESS ACTIVITIES IN EE — FI

ELEMENT 2.1 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-ON LOCAL AND NATIONAL LEVELS

10. ASSESS APPROPRIATENESS OF EE CONTENT — FI

ELEMENT 2.2 IN 4/1/78 LIST (SOURCE: EE REGS)

11. EVALUATE EFFECTIVENESS OF MODEL CURRICULA — FC

ELEMENT 2.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)

12. EVALUATE EE METHODS, TOOLS AND RESOURCES — FI

DERIVED FROM ELEMENT 2.4 IN 4/1/78 LIST (SOURCE: GRANT)

13. ASSESS NEEDS OF KEY EE PEOPLE — FIP

ELEMENT 2.5 IN 4/1/78 LIST (SOURCE: HOUSE)
-OF PEOPLE REQUIRED FOR SUCCESSFUL INSTITUTIONALIZATION OF EE

14. EVALUATE PROGRAMS FOR EE TEACHER TRAINING — PF

ELEMENT 2.6 IN 4/1/78 LIST (SOURCE: HOUSE)

15. EVALUATE PUBLIC MEETINGS ON EE TOPICS — I

ELEMENT 2.7 IN 4/1/78 LIST (SOURCE: GRANT)

16. TO ASSESS ALTERNATIVE RESOLUTIONS TO ENVIRONMENTAL ISSUES — LFIT

DERIVED FROM ELEMENT 2.8 IN 4/1/78 LIST (SOURCE: EE REGS)

17. COLLECT INFORMATION ON EE — FIR

ELEMENT 3.1 IN 4/1/78 LIST (SOURCE: ARIZ.)

18. COLLECT DATA ON LOCAL ENVIRONMENTAL FACTORS AND TRENDS — RFI

ELEMENT 3.2 IN 4/1/78 LIST (SOURCE: HOUSE)
-ON ENVIRONMENTAL ISSUES

19. CONDUCT FIELD TRIPS FOR EE — FI

ELEMENT 4.1 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-DEALING WITH ENVIRONMENTAL FACTORS

20. CONDUCT ISSUE-ORIENTED EFFORTS REGARDING HUMAN SETTLEMENTS — FI

ELEMENT 4.2 IN 4/1/78 LIST (SOURCE: EE REGS)

-DEALING WITH LIFE SUPPORT RESOURCES
-DEALING WITH THE IMPLICATIONS OF INTERRELATED HUMAN LIFE SUPPORT ACTIVITIES

21. CONDUCT INQUIRIES INTO LOCAL ENVIRONMENTAL ISSUES — FI

ELEMENT 4.3 IN 4/1/78 LIST (SOURCE: EE REGS)
-TO DEVELOP UNDERSTANDING OF CAUSES, EFFECTS, ISSUES, AND OPTIONS, SURROUNDING A LOCAL ENVIRONMENTAL PROBLEM

22. CONDUCT LECTURE-DEMONSTRATIONS — FI

ELEMENT 4.4 IN 4/1/78 LIST (SOURCE: ARIZ. *)

23. CONDUCT PRACTICUMS IN EE — FI

ELEMENT 4.5 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-WHERE LEARNER LEARNS BY DOING
-PRACTICUM REFERS TO EXERCISES LIKE PROBLEM SOLVING, CASE STUDIES, ROLE-PLAYING, POLITICAL DECISIONS

24. CONDUCT OUTDOOR ACTIVITIES IN EE — FI

ELEMENT 4.6 IN 4/1/78 LIST (SOURCE: ARIZ. *)

25. CONDUCT PUBLIC MEETINGS ON ENVIRONMENTAL TOPICS — I

ELEMENT 4.7 IN 4/1/78 LIST (SOURCE: GRANT)

26. CONDUCT PROGRAMS IN EE TEACHER TRAINING — FP

ELEMENT 4.8 IN 4/1/78 LIST (SOURCE: GRANT)

27. CONDUCT WORKSHOPS ON EE IN THE FORMAL EDUCATION SECTOR — FP

ELEMENT 4.9 IN 4/1/78 LIST (SOURCE: GRANT)

28. DEMONSTRATE CURRICULA — FC

ELEMENT 5.1 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)
-IN TEST SITUATIONS IN MODEL PROGRAMS - I.E., PILOT TEST BEFORE WIDE DISTRIBUTION

29. TO BE CONCERNED ABOUT BETTER RELATIONS BETWEEN PEOPLE AND THEIR ENVIRONMENT — LFIHX

DERIVED FROM ELEMENT 6.1 IN 4/1/78 LIST (SOURCE: TBIL)

30. DEVELOP ACTIVITIES — FI

ELEMENT 6.2 IN 4/1/78 LIST (SOURCE: GRANT)
-THAT WILL FACILITATE ENVIRONMENTAL LEARNING
-INCLUDED IN ELEMENT 44 OF THIS TEXT

31. DEVELOP CORE THEMES FOR EE — FI

ELEMENT 6.2A IN 4/1/78 LIST (SOURCE: ARIZ. 1.6, 1.8)
-CORE THEMES REFER TO SEVERAL NARROW, SPECIFIC THEMES

32. DEVELOP NEW CURRICULA — FC

ELEMENT 6.3 IN 4/1/78 LIST
-THAT ARE NEW AND IMPROVED (SOURCE: ARIZ. 1.3)
-FOR GENERAL EE AT POSTSECONDARY LEVEL (SOURCE: ARIZ. *)
-RELATED TO TECHNICAL CAREERS IN EE AT POSTSECONDARY LEVEL (SOURCE: ARIZ. *)
-THAT ARE INTERDISCIPLINARY, DEALING WITH ENVIRONMENTAL EQUALITY AND ECOLOGICAL BALANCE (SOURCE: EE REGS)
-IN EE IN THE FORMAL EDUCATION SYSTEM (SOURCE: UVAS)

33. DEVELOP DELIVERY SYSTEM FOR EE — FIRP

DERIVED FROM ELEMENT 6.3A IN 4/1/78 LIST

34. DEVELOP FILMS ON EE CORE THEMES — FIR

ELEMENT 6.4 IN 4/1/78 LIST (SOURCE: ARIZ. 1.12)

35. DEVELOP FRAMEWORK FOR EE — FIR

ELEMENT 6.5 IN 4/1/78 LIST (SOURCE: ARIZ. *)

36. PREPARE GUIDES FOR DEVELOPING EE CURRICULUM — FCR

DERIVED FROM ELEMENT 6.6 IN 4/1/78 LIST (SOURCE: ARIZ. *, GRANT)
-FOR TEACHERS
-FOR TEACHERS ON EE CURRICULUM

---

37. TO DEVELOP SOUND ENVIRONMENTAL GOALS — LFITUY

DERIVED FROM ELEMENT 6.7 IN 4/1/78 LIST (SOURCE: GRANT)

38. PREPARE INFORMATION ON EE ISSUES FOR PUBLIC USE — IFR

ELEMENT 6.8 IN 4/1/78 LIST (SOURCE: GRANT)

39. DEVELOP REGIONAL SOCIOCULTURAL INDICATORS — FI

ELEMENT 6.10 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)
-TO HELP ASSESS ENVIRONMENTAL DEVELOPMENTS

40. DEVELOP EFFECTIVE EE MATERIALS — FIR

ELEMENT 6.11 IN 4/1/78 LIST (SOURCE: GRANT)
-THAT ARE INSTRUCTIONAL, FOR EE
-INCLUDED IN ELEMENT 44 OF THIS TEXT

41. DEVELOP METHODS

ELEMENT 6.12 IN 4/1/78 LIST (SOURCE: ARIZ. 1.7)
-THAT ARE EFFECTIVE
-INCLUDED IN ELEMENT 44 IN THIS TEXT

42. DEVELOP METHODS AND TOOLS FOR CLARIFYING VALUES — FIR

DERIVED FROM ELEMENT 6.13 IN 4/1/78 LIST: (SOURCE: ARIZ. 1.9)
-IN COURSES AND PROGRAMS

43. DEVELOP INSTRUCTIONAL OBJECTIVES FOR EE — FIC

ELEMENT 6.14 IN 4/1/78 LIST (SOURCE: GRANT)

44. DEVELOP EFFECTIVE TOOLS, METHODS AND RESOURCES FOR EE — FICR

DERIVED FROM ELEMENT 6.15 IN 4/1/78 LIST (SOURCE: EE REGS)
-THAT ARE EDUCATIONAL, DEALING WITH THE TOTAL HUMAN ENVIRONMENT
-FOR INTERDISCIPLINARY SYNTHESIS AND PROBLEM SOLVING

45. DEVELOP PRACTICES — FIC

ELEMENT 6.16 IN 4/1/78 LIST (SOURCE: EE REGS)
-THAT WILL BE EFFECTIVE FOR EE
-INCLUDED IN ELEMENT 44 OF THIS TEXT

46. DEVELOP PROGRAM FOR EE TEACHER TRAINING — PF

ELEMENT 6.17 IN 4/1/78 LIST
-FOR TEACHER COMPETENCY TO HELP ARTICULATE CORE THEMES (IN-SERVICE TRAINING) (SOURCE: ARIZ. 1.11)
-OF FORMAL EDUCATION IN EE (SOURCE: UVAS)

47. PARTICIPATE IN THE FORMULATION OF SOUND ENVIRONMENTAL POLICY — IF

ELEMENT 6.18 IN 4/1/78 LIST (SOURCE: UVAS)
-IDENTICAL TO ELEMENT 134 IN TEXT, SO NOT MAPPED

48. TO DEVELOP STRATEGIES TO RESOLVE ENVIRONMENTAL PROBLEMS — LIFTUY

DERIVED FROM ELEMENT 6.19 IN 4/1/78 LIST (SOURCE: TBIL)
-THAT WILL BE EFFECTIVE FOR UNDERSTANDING, PREVENTING, AND SOLVING ENVIRONMENTAL PROBLEMS

49. DEVELOP CENTER FOR ENVIRONMENTAL LEARNING — FIR

ELEMENT 6.20 IN 4/1/78 LIST (SOURCE: GRANT)

50. DISSEMINATE ATTITUDES — FI

ELEMENT 7.1 IN 4/1/78 LIST (SOURCE: TBIL)
-GROUP AGREED TO ELIMINATE THIS ELEMENT FROM THE MODEL IN THE MAY, 1978, SESSIONS AT UO

51. DISSEMINATE GUIDES FOR DESIGNING EE CURRICULUM — FCR

ELEMENT 7.2 IN 4/1/78 LIST (SOURCE: ARIZ, *)
-FOR TEACHERS

52. DISSEMINATE INFORMATION ON EE TEACHER TRAINING PROGRAMS — FIRC

ELEMENT 7.3 IN 4/1/78 LIST
-TO THE PUBLIC ON MEANS OF ACQUIRING EXISTING EE MATERIALS EFFICIENTLY (SOURCE: ARIZ, 1.4)
-TO THE PUBLIC ON PAST PROGRAMS AND ACTIVITIES IN EE (SOURCE: ARIZ, 1.14)
-ON USEFUL EE PROGRAM DEVELOPMENT ALTERNATIVES (SOURCE: TBIL)
-RELATING TO EE CURRICULA AND TO EE GENERALLY (SOURCE: EE REGS)

53. DISSEMINATE INFORMATION ON ENVIRONMENTAL ISSUES — FIR

ELEMENT 7.4 IN 4/1/78 LIST (SOURCE: HOUSE)

54. DISSEMINATE KNOWLEDGE — FI

ELEMENT 7.5 IN 4/1/78 LIST (SOURCE: TBIL)
-TOWARD THE SOLUTION OF ENVIRONMENTAL PROBLEMS
-KNOWLEDGE CANNOT BE DISSEMINATED, AND DISSEMINATION OF INFORMATION HAS BEEN ACCOUNTED FOR IN SEVERAL OTHER ELEMENTS, SO THIS ELEMENT HAS NOT BEEN MAPPED

55. DISSEMINATE MATERIALS — CFR

ELEMENT 7.6 IN 4/1/78 LIST
-FOR USE IN EE INSTRUCTION (SOURCE: GRANT)
-RELATING TO CURRICULA IN EE (SOURCE: ARIZ, 1.3)

56. DISSEMINATE PUBLICATIONS ON EE — IR

ELEMENT 7.7 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-BY NON-SCHOOL BASED ORGANIZATIONS

57. DISSEMINATE SKILLS FI

ELEMENT 7.8 IN 4/1/78 LIST (SOURCE: TBIL)
-TOWARD THE SOLUTION OF ENVIRONMENTAL PROBLEMS
-SKILLS PER SE CANNOT BE DISSEMINATED. THE AUTHOR'S ASSUMED INTENTION HAS BEEN DEALT WITH IN OTHER ELEMENTS HAVING TO DO WITH METHODS AND TOOLS. THUS, THIS ELEMENT HAS NOT BEEN MAPPED

58. DISSEMINATE VALUES FI

ELEMENT 7.9 IN 4/1/78 LIST (SOURCE: TBIL)
-TOWARD THE SOLUTION OF ENVIRONMENTAL PROBLEMS
-LIKE ATTITUDES, VALUES CAN BE FOSTERED, BUT NOT DISSEMINATED. AS MANY OF THE LEARNING OBJECTIVE ELEMENTS DEAL WITH PROMOTING VALUES, THIS ELEMENT HAS NOT BEEN MAPPED.

59. EMPHASIZE AWARENESS FI

ELEMENT 8.1 IN 4/1/78 LIST (SOURCE: TBIL)
-OF INTERACTIONS AND INTERDEPENDENCE AMONG FACTORS
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

60. EMPHASIZE COMPLEX NATURE OF THE ENVIRONMENT FI

ELEMENT 8.2 IN 4/1/78 LIST (SOURCE: TBIL)
-CAUSED BY INTERACTIONS
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

61. EMPHASIZE EFFECTIVENESS OF EE MATERIALS AND METHODS FIR

ELEMENT 8.3 IN 4/1/78 LIST
-OF METHODOLOGIES USED (SOURCE: ARIZ. 1.7)
-OF RESOURCES AND OPTIONS (SOURCE: TBIL)
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

62. EMPHASIZE ELEMENTS FUNDAMENTAL TO EE FC

ELEMENT 8.4 IN 4/1/78 LIST (SOURCE: ARIZ. *)

-FUNDAMENTAL TO EE IN A UNIFIED INTERDISCIPLINARY CURRICULUM
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

63. EMPHASIZE IMPORTANCE FI

ELEMENT 8.5 IN 4/1/78 LIST (SOURCE: TBIL)
-OF ENVIRONMENTAL CONCERNS IN DEVELOPMENT
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

64. EMPHASIZE INTERRELATIONSHIPS FI

ELEMENT 8.6 IN 4/1/78 LIST (SOURCE: TBIL)
-OF FACTORS THROUGH OBSERVATION AND THROUGH PRACTICAL EXPERIENCE IN SPECIFIC ENVIRONMENTS
-ASSUMED TO BE PART OF ELEMENT 31 (CORE THEMES) IN THIS TEXT

65. EMPHASIZE INTERDISCIPLINARY MATERIALS FIR

ELEMENT 8.7 IN 4/1/78 LIST (SOURCE: TBIL)

66. EMPHASIZE PROCEDURES FIC

ELEMENT 8.8 IN 4/1/78 LIST (SOURCE: EE REGS)
-FOR LEARNING, AS WELL AS SPECIFIC CONTENT
-ASSUMED TO BE PART OF ELEMENT 35 (FRAMEWORK FOR EE) IN THIS TEXT

67. TO BE CONCERNED ABOUT THE PRESENT AND FUTURE MATERIAL AND SPIRITUAL NEEDS OF HUMANKIND LFIZ

DERIVED FROM ELEMENT 8.9 IN 4/1/78 LIST (SOURCE: TBIL)

68. FACILITATE INTERDISCIPLINARY COOPERATION PFI

ELEMENT 9.1 IN 4/1/78 LIST (SOURCE: ARIZ. 1.8).
-OF PERSONS IN THE DISCIPLINES RELEVANT TO EE TO WORK IN AN INTEGRATIVE MANNER

69. FACILITATE CONTRIBUTIONS TO UNDERSTANDING THE HUMAN ENVIRONMENT FI

ELEMENT 9.2 IN 4/1/78 LIST (SOURCE: TBIL)

70. FACILITATE DEVELOPMENT OF HARMONIOUS RELATIONSHIPS — FI

ELEMENT 9.3 IN 4/1/78 LIST
-BETWEEN THE INDIVIDUAL AND THE ENVIRONMENT (SOURCE: TBIL)
-NEW PATTERNS OF INDIVIDUAL AND COLLECTIVE BEHAVIOR THAT EMPHASIZE ENVIRONMENTAL RESPONSIBILITY (SOURCE: TBIL)

71. FACILITATE USE OF EE MATERIALS AND PRACTICES — RFI

ELEMENT 9.4 IN 4/1/78 LIST (SOURCE: EE REGS)
-IN AN EFFECTIVE WAY

72. FACILITATE INVOLVEMENT — FI

ELEMENT 9.5 IN 4/1/78 LIST (SOURCE: ARIZ. 1.17)
-OF THE FORMAL EDUCATION SYSTEM IN COMMUNITY EDUCATION

73. INTEGRATE OUTDOOR EDUCATION WITH SOCIAL AND BEHAVIORAL PRINCIPLES — FI

ELEMENT 9.6 IN 4/1/78 LIST (SOURCE: ARIZ. *)

74. FACILITATE PERCEPTION AND UNDERSTANDING — FI

ELEMENT 9.7 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)
-BY THE LEARNER OF CONCEPTS OF ENVIRONMENT, ENVIRONMENTAL PRINCIPLES, PROBLEMS, AND ABILITY TO IDENTIFY AND ASSESS ALTERNATIVE SOLUTIONS

75. MARSHALL GROUPS WITH POTENTIAL LEADERSHIP ROLES IN EE — PFI

DERIVED FROM ELEMENT 9.8 AND 9.6 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-THE ALASKA COALITION IS AN EXAMPLE OF MARSHALLING GROUPS FOR ENVIRONMENTAL EDUCATION. IT IS COMPOSED OF A VARIETY OF ESTABLISHED ORGANIZATIONS, INCLUDING THE SIERRA CLUB AND THE NATIONAL AUDUBON SOCIETY, WHICH HAVE MADE THEIR MAILING LISTS AVAILABLE TO THE ALASKA COALITION FOR DISTRIBUTING INFORMATION ON A SPECIFIC ENVIRONMENTAL ISSUES. LOCAL CHAPTERS OF MEMBER ORGANIZATIONS ALSO INFORM THEIR INDIVIDUAL MEMBERS ABOUT THE STATUS OF THE ISSUE OF INTEREST.

76. FACILITATE PARTICIPATION IN DECISION-MAKING AND INQUIRY — IF

ELEMENT 9.9 IN 4/1/78 LIST
-IN DECISION-MAKING RELATIVE TO ENVIRONMENTAL QUALITY (SOURCE: TBIL)
-IN INQUIRIES OF THE SHORT AND LONG RANGE EFFECTS OF -
HUMAN ACTIVITIES ON SOCIETAL RESOURCES AND
GENERAL PUBLIC POLICY (SOURCE: EE REGS)

77. FACILITATE INTERDISCIPLINARY UNDERSTANDING — FI

DERIVED FROM ELEMENT 9.10 IN 4/1/78 LIST (SOURCE: NOT IDENTIFIED IN WARFIELD'S 5/4/78 MEMO)
-OF TRADITIONAL SUBJECTS IN AN INTERDISCIPLINARY PATTERN

78. FUND ENVIRONMENTAL EDUCATION — RFI

ELEMENT 10.1 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-DIRCTLY BY NON-SCHOOL BASED ORGANIZATIONS

79. IDENTIFY DISSEMINATION MECHANISMS — RFI

ELEMENT 11.1 IN 4/1/78 LIST (SOURCE: GRANT)
-FOR ENVIRONMENTAL INFORMATION

80. IDENTIFY KEY PEOPLE FOR EE — PFI

ELEMENT 11.2 IN 4/1/78 LIST (SOURCE: HOUSE)
-IN THE EDUCATION SYSTEM WHO ARE IMPORTANT TO
SUCCESSFUL ENVIRONMENTAL EDUCATION
-THIS ELEMENT INCLUDES FOUR GROUPS OF ACTORS
.LEARNERS
.TEACHERS AND COMMUNITY EE FACILLITATORS
.PERSONS IN ORGANIZATIONS AND INSTITUTIONS THAT SUPPORT ENVIRONMENTAL EDUCATION
.INTERMEDIARY GROUP, I.E., PEOPLE WHO TRAIN TEACHERS AND COMMUNITY EE FACILITATORS

81. IDENTIFY TARGET GROUPS FOR PUBLIC MEETINGS — IR

ELEMENT 11.3 IN 4/1/78 LIST (SOURCE: GRANT)

82. INSTITUTIONALIZE ANALYSIS OF PROGRESS IN EE — FI

ELEMENT 12.1 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)

83. INSTITUTIONALIZE CURRICULUM — CF

ELEMENT 12.2 IN 4/1/78 LIST
-IN EE AT POSTSECONDARY LEVELS (SOURCE: ARIZ. *)
-IN TECHNICAL/CAREER MATTERS AT POSTSECONDARY LEVELS (SOURCE: ARIZ. *)
-IN EE IN FORMAL EDUCATION SYSTEMS (SOURCE: GRANT)

84. INSTITUTIONALIZE ENVIRONMENTAL EDUCATION — FI

ELEMENT 12.2A IN 4/1/78 LIST (SOURCE: WAREIELD)
-IN THE UNITED STATES

85. INSTITUTIONALIZE SOCIAL DIAGNOSIS/PROGNOSIS — FI

ELEMENT 12.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)
-ON A CONTINUING BASIS

86. INSTITUTIONALIZE PROGRAMS IN EE — F

ELEMENT 12.4 IN 4/1/78 LIST (SOURCE: 1.3)
-AT ELEMENTARY AND SECONDARY LEVELS

87. INSTITUTIONALIZE ONGOING EVALUATION AND FEEDBACK — FI

FROM ELEMENT 12.5 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)

88. PROVIDE TECHNICAL ASSISTANCE FOR EE — RPFI

DERIVED FROM ELEMENT 12.6 IN 4/1/78 LIST (SOURCE: GRANT)
-TECHNICAL ASSISTANCE REFERS TO CAPACITY BUILDING, I.E., SKILLS, TRAINING ADDITIONAL PERSONNEL, ETC.

89. MODIFY ATTITUDES AND BEHAVIOR OF TEACHERS — PFI

DERIVED FROM ELEMENT 13.1 AND 13.2 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-RELEVANT TO EE

90. MODIFY ATTITUDES AND BEHAVIOR OF COMMUNITY EDUCATION FACILITATORS — FI

DERIVED FROM ELEMENT 13.1 AND 13.2 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-RELEVANT TO EE

91. MODIFY CURRICULA TO INTEGRATE EE — FC

ELEMENT 13.3 IN 4/1/78 LIST (SOURCE: TOIL)
-SO THAT EE CONTENT CAN BE INTEGRATED INTO THEM WHERE POSSIBLE AND APPROPRIATE
-"MODIFY" REFERS TO A STRATEGY THAT CAN BE FOLLOWED; A WAY TO CONCEPTUALIZE CHANGE IN A CURRICULUM, AS DISCUSSED AT 5/1/78 SESSION IN DAYTON

92. MODIFY INSTITUTIONS TO FACILITATE EE — FI

ELEMENT 13.4 IN 4/1/78 LIST (SOURCE: ARIZ. 1.12)
-TO REWARD AND FACILITATE THE DEVELOPMENT AND USE OF CORE THEMES AND THEIR DELIVERY SYSTEMS

93. MODIFY TOOLS AND METHODS USED IN EE — FIR

ELEMENT 13.5 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-FOR PRESENTATION OF EE MATERIALS
-MODIFICATION IS CONSIDERED A SEPARATE STRATEGY FROM DEVELOPMENT

94. MODIFY PROGRAMS OF EE TEACHER TRAINING — PF

ELEMENT 13.6 IN 4/1/78 LIST (SOURCE: HOUSE)
-MODIFICATION IS CONSIDERED A SEPARATE STRATEGY FROM DEVELOPMENT
-REFERS TO EXISTING TRAINING PROGRAMS

95. PLAN FIELD TRIPS — FI

ELEMENT 14.1 IN 4/1/78 LIST (SOURCE: GRANT)
-ON ENVIRONMENTAL FACTORS

96. PLAN FOLLOWUP OF PUBLIC MEETINGS — I

ELEMENT 14.2 IN 4/1/78 LIST (SOURCE: GRANT)

-AFTER PUBLIC MEETINGS

97. PLAN INCORPORATION — FC

ELEMENT 14.3 IN 4/1/78 LIST (SOURCE: GRANT)
-OF EE INTO EXISTING CURRICULUM

98. PLAN PUBLIC MEETINGS ON ENVIRONMENTAL TOPICS — I

ELEMENT 14.4 IN 4/1/78 LIST (SOURCE: GRANT)

99. PLAN OUTDOOR ECOLOGY CENTERS — RFI

ELEMENT 14.5 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)

100. RECRUIT RESOURCE PERSONS FOR PUBLIC MEETING — PI

ELEMENT 15.1 IN 4/1/78 LIST (SOURCE: HOUSE)
-FOR EE PUBLIC MEETINGS

101. PROVIDE TRAINING IN DECISION-MAKING TO ALL LEARNERS — IF

ELEMENT 16.1 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)
-IN ALL SECTORS
-INTRODUCING ENVIRONMENTAL APPRECIATIONS INTO THEIR WORK AND STUDY
-INTEGRATING PROCESS AND CONTENT (DECISION-MAKING IN EE)
-ENVIRONMENTAL ISSUES CAN BE A VEHICLE FOR TEACHING DECISION-MAKING

102. TRAIN INDIVIDUALS — FI

ELEMENT 16.2 IN 4/1/78 LIST (SOURCE: ARIZ. 1.10)
-TO WORK FROM A HOLISTIC FRAME OF REFERENCE CONCERNING THE ENVIRONMENT
-SIMILAR TO ELEMENT 2 OF THIS TEXT

103. EDUCATE KEY PERSONNEL — PFI

ELEMENT 16.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.16)
-REGARDING CORE THEMES AND THE RATIONALE FOR EE

104. TRAIN COMMUNITY EE FACILITATORS — IP

DERIVED FROM ELEMENT 16.4 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)
-TO PARTICIPATE IN ENVIRONMENTAL EDUCATION

105. TRAIN TEACHERS IN EE — FP

ELEMENT 16.5 IN 4/1/78 LIST (SOURCE: ARIZ. *)
-IN FORMAL SECTOR

106. DEVELOP PROGRAMS FOR COMMUNITY EE — I

DERIVED FROM ELEMENT 6.17 IN 4/1/78 LIST (SOURCE: UVAS)

107. DEVELOP OBJECTIVES FOR EE TEACHER TRAINING — PF

DERIVED FROM ELEMENT 6.14 IN 4/1/78 LIST (SOURCE: GRANT)

108. IDENTIFY TEACHERS AND FACILITATORS AS TARGET GROUPS FOR EE INFORMATION DISSEMINATION — IP

DERIVED FROM ELEMENT 11.3 IN 4/1/78 LIST (SOURCE: HOUSE)

109. UTILIZE SOCIAL DIAGNOSIS/PROGNOSIS — FI

DERIVED FROM ELEMENT 12.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)

110. DEVELOP TRAINING PROGRAM FOR COMMUNITY EE FACILITATORS — PI

DERIVED FROM 6.17 IN 4/1/78 LIST
-TO HELP ARTICULATE CORE THEMES (SOURCE: ARIZ. 1.11)
-FOR INFORMAL EDUCATION SECTOR (SOURCE: UVAS)

111. TO BE AWARE OF CAREER OPPORTUNITIES IN THE ENVIRONMENTAL AREA — LFIV

DERIVED FROM ELEMENT 1.1 IN 4/1/78 LIST (SOURCE: ARIZ. *, ARIZ. 1.10)

112. TO RESOLVE ENVIRONMENTAL ISSUES — LIFTUH

DERIVED FROM ELEMENT 1.1 IN 4/1/78 LIST (SOURCE: TBIL)

113. TO BE AWARE OF IMPORTANT ENVIRONMENTAL ISSUES — LFIV

DERIVED FROM ELEMENT 1.2 IN 4/1/78 LIST (SOURCE: UVAS)

114. TO KNOW ENVIRONMENTAL CONCEPTS AND PRINCIPLES — LFIN

DERIVED FROM ELEMENT 1.2 IN 4/1/78 LIST (SOURCE: EE REGS)

115. TO BE AWARE OF THE COMPLEX INTERACTIONS AND INTERDEPENDENCY OF ELEMENTS IN THE ENVIRONMENT — LFIV

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)

116. TO SYNTHESIZE CONCEPTS FROM MANY DIFFERENT DISCIPLINES — LFIT

DERIVED FROM ELEMENT 1.5 IN 4/1/78 LIST (SOURCE: TBIL)

117. TO ANALYZE ENVIRONMENTAL SYSTEMS — LFIS

ORIGINATED BY UD GROUP IN 5/10/78 MODELING SESSION

118. ACQUIRE SKILLS IN COLLECTING EE DATA — CFIR

DERIVED FROM ELEMENT 1.5 IN 4/1/78 LIST (SOURCE: ARIZ. *)

119. TO KNOW METHODOLOGY FOR RESOLVING ENVIRONMENTAL ISSUES — LFIN

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: TBIL)

120. TO CHOOSE BETWEEN ALTERNATIVE RESOLUTIONS OF ENVIRONMENTAL ISSUES — LFIU

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: EE REGS)

121. TO DIAGNOSE ENVIRONMENTAL ISSUES — LFIS

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: TBIL)

122. TO ASSESS THE LONG TERM IMPACT OF PERSONAL AND OCCUPATIONAL DECISIONS — LFIUY

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: EE REGS)

123. TO SITUATE ENVIRONMENTAL ISSUES IN THE NEXT LARGER CONTEXT — LFIS

DERIVED FROM ELEMENT 1.6 IN 4/1/78 LIST (SOURCE: ARIZ. 1.5)

124. TO UNDERSTAND IMPACTS OF HUMAN ACTIONS ON ENVIRONMENT — LFIT

DERIVED FROM ELEMENT 1.8 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)

125. COLLECT DATA ON EE — CRFI

DERIVED FROM GROUP DISCUSSION OF ELEMENT 3.1 IN 4/1/78 LIST ON 5/2/78 IN DAYTON (SOURCE: ARIZ. *)
-AT FEDERAL LEVEL, DATA COLLECTION REQUIRES ONE TO DEFEND THE NEED, DESIGN A FORM, AND GET IT APPROVED, PRINTED, DISTRIBUTED, AND COLLECTED

126. CONDUCT ISSUE-ORIENTED EFFORTS REGARDING LIFE-SUPPORT RESOURCES — FI

DERIVED FROM ELEMENT 4.2 IN 4/1/78 LIST (SOURCE: EE REGS)
-INCLUDED IN ELEMENT 20 OF THIS TEXT

127. CONDUCT ISSUE-ORIENTED EFFORTS REGARDING THE IMPLICATIONS OF INTERRELATED HUMAN LIFE SUPPORT ACTIVITIES — FI

DERIVED FROM ELEMENT 4.2 IN 4/1/78 LIST (SOURCE: EE REGS)
-INCLUDED IN ELEMENT 20 OF THIS TEXT

128. CONDUCT WORKSHOPS ON EE IN THE INFORMAL EDUCATION SECTOR — I

DERIVED FROM ELEMENT 4.9 IN 4/1/78 LIST (SOURCE: ARIZ. *)

129. DEMONSTRATE NEW APPROACHES TO COMMUNITY EE — I

DERIVED FROM ELEMENT 5.1 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)

130. TO FOSTER BETTER RELATIONS BETWEEN PEOPLE AND THEIR ENVIRONMENT — LIFWX

DERIVED FROM ELEMENT 6.1 IN 4/1/78 LIST (SOURCE: TBIL)

131. DEVELOP EFFECTIVE EE MATERIALS FOR MASS MEDIA — FIR

DERIVED FROM ELEMENT 6.11 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)
-DEALING WITH ENVIRONMENT AND ECOLOGY

132. EVALUATE NEW APPROACHES TO COMMUNITY EE — I

ORIGINATED BY THE UD GROUP DURING 5/10/78 MODEING SESSION

133. PREPARE GUIDES FOR DEVELOPING COMMUNITY EE — I

DERIVED FROM ELEMENT 6.6 IN 4/1/78 LIST (SOURCE: GRANT)
-FOR COMMUNITY EE FACILITATORS

134. TO DEVELOP SOUND ENVIRONMENTAL POLICY — LIFWY

DERIVED FROM ELEMENT 6.18 IN 4/1/78 LIST (SOURCE: UVAS)

135. DISSEMINATE MATERIALS TO MASS MEDIA — IFR

DERIVED FROM ELEMENT 7.6 IN 4/1/78 LIST (SOURCE: UVAS)
-DEALING WITH ENVIRONMENT AND ECOLOGY

136. TO BE ACTIVELY INVOLVED IN LOCAL ENVIRONMENTAL ISSUES — LFIW

DERIVED FROM ELEMENT 9.5 IN 4/1/78 LIST (SOURCE: EE REGS)

137. FACILITATE INVOLVEMENT OF LEARNERS IN LOCAL ENVIRONMENTAL ISSUES — LFI

DERIVED FROM 9.5 IN 4/1/78 LIST (SOURCE: EE REGS)

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138. TO SUSTAIN THE HUMAN ENVIRONMENT — LFIW

DERIVED FROM ELEMENT 1.7 IN 4/1/78 LIST (SOURCE: TBIL)

139. TO RESPONSIBLY MANAGE THE HUMAN ENVIRONMENT — LFISTUXZ

DERIVED FROM ELEMENT 9.9 IN 4/1/78 LIST (SOURCE: TBIL)

140. TO SUSTAIN AND ENHANCE HUMAN DEVELOPMENT — LIFYZ

DERIVED FROM ELEMENT 9.9 IN 4/1/78 LIST (SOURCE: TBIL)

141. ASSESS MODEL CURRICULA — CF

DERIVED FROM ELEMENT 2.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.3)
-INCLUDED IN ELEMENT 11 IN THIS TEXT. RECOMBINED BY UD GROUP IN 21 JUNE 1978 MODELING SESSION

142. DEVELOP INSTITUTIONAL SUPPORT FOR EE IN FORMAL EDUCATION SYSTEMS — F

DERIVED FROM ELEMENT 12.2 IN 4/1/78 LIST
-INCLUDES ELEMENTARY, SECONDARY AND POST-SECONDARY LEVELS (SOURCE: GRANT)
-IN TECHNICAL/CAREER MATTERS AT POST-SECONDARY LEVEL (SOURCE: ARIZ. *)

143. DEVELOP INSTITUTIONAL SUPPORT FOR SOCIAL DIAGNOSIS AND PROGNOSIS — FI

DERIVED FROM ELEMENT 12.3 IN 4/1/78 LIST (SOURCE: ARIZ. 1.6)
-ON A CONTINUING BASIS

144. BUILD OUTDOOR ECOLOGY CENTER — RFI

DERIVED FROM ELEMENT 14.5 IN 4/1/78 LIST (SOURCE: ARIZ. 1.4)

145. MAKE RESOURCE PERSONS AVAILABLE FOR PUBLIC MEETINGS — PRFI

DERIVED FROM ELEMENT 15.1 IN 4/1/78 LIST (SOURCE: HOUSE)

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146. DEVELOP OBJECTIVES FOR COMMUNITY EE FACILITATOR TRAINING — PI

DERIVED FROM ELEMENT 6.14 IN 4/1/78 LIST (SOURCE: GRANT)

147. IDENTIFY TARGET LEARNERS FOR EE INFORMATION DISSEMINATION — FIR

DERIVED FROM ELEMENT 11.3 IN 4/1/78 LIST (SOURCE: GRANT)
-INCLUDED IN ELEMENT 80 OF THIS TEXT

148. TO ACQUIRE SKILLS IN DATA COLLECTION ON ENVIRONMENTAL ISSUES — LFIO

DERIVED FROM ELEMENT 3.2 IN 4/1/78 LIST (SOURCE: ARIZ. *)

149. TO IDENTIFY IMPORTANT ELEMENTS OF THE ENVIRONMENT — LFIS

ORIGINATED BY UD TEAM IN 5/10/78 MODELING SESSION

150. TO STRUCTURE THE ELEMENTS OF THE ENVIRONMENT INTO COHERENT PATTERNS — LFIS

ORIGINATED BY UD TEAM IN 5/10/78 MODELING SESSION

151. TO VALUE A HARMONIOUS RELATIONSHIP WITH THE ENVIRONMENT — LFIY

DERIVED FROM ELEMENT 9.3 IN 4/1/78 LIST (SOURCE: TBIL)

152. DISSEMINATE INFORMATION ON EE METHODS, TOOLS, AND RESOURCES — IF
DERIVED FROM ELEMENT 7.3 IN 4/1/78 LIST (SOURCE: HOUSE)

153. SYNTHESIZE EDUCATIONAL RESEARCH ON METHODS AND TOOLS APPROPRIATE TO EE — IF
ADDED BY THE UD GROUP IN THE 5/9/78 MODELING SESSION

154. DEVELOP NEW APPROACHES TO COMMUNITY EE — I
ADDED BY THE UD GROUP IN THE 5/9/78 MODELING SESSION

155. IDENTIFY PRIORITY AREAS FOR FUNDING AND DEVELOPING EE — IF
ADDED BY THE UD GROUP IN THE 5/9/78 MODELING SESSION

156. MODIFY CURRENT APPROACHES TO COMMUNITY EE — I
ORGINATED BY UD GROUP IN 5/10/78 MODELING SESSION

157. DISSEMINATE INFORMATION ON COMMUNITY EE FACILITATOR TRAINING PROGRAMS — IP
ORGINATED BY UD GROUP IN 5/10/78 MODELING SESSION

158. EVALUATE COMMUNITY EE FACILITATOR TRAINING PROGRAMS — IP
ORGINATED BY UD GROUP IN 5/10/78 MODELING SESSION

159. DISSEMINATE GUIDES FOR DESIGNING NEW COMMUNITY EE APPROACHES — I
ORGINATED BY UD GROUP IN 5/10/78 MODELING SESSION

160. MAKE FORMATIVE EVALUATION OF ENVIRONMENTAL LEARNING DESIGNS — CIU
-ORGINATED BY UD GROUP IN 21 JUNE 1978 MODELING SESSION

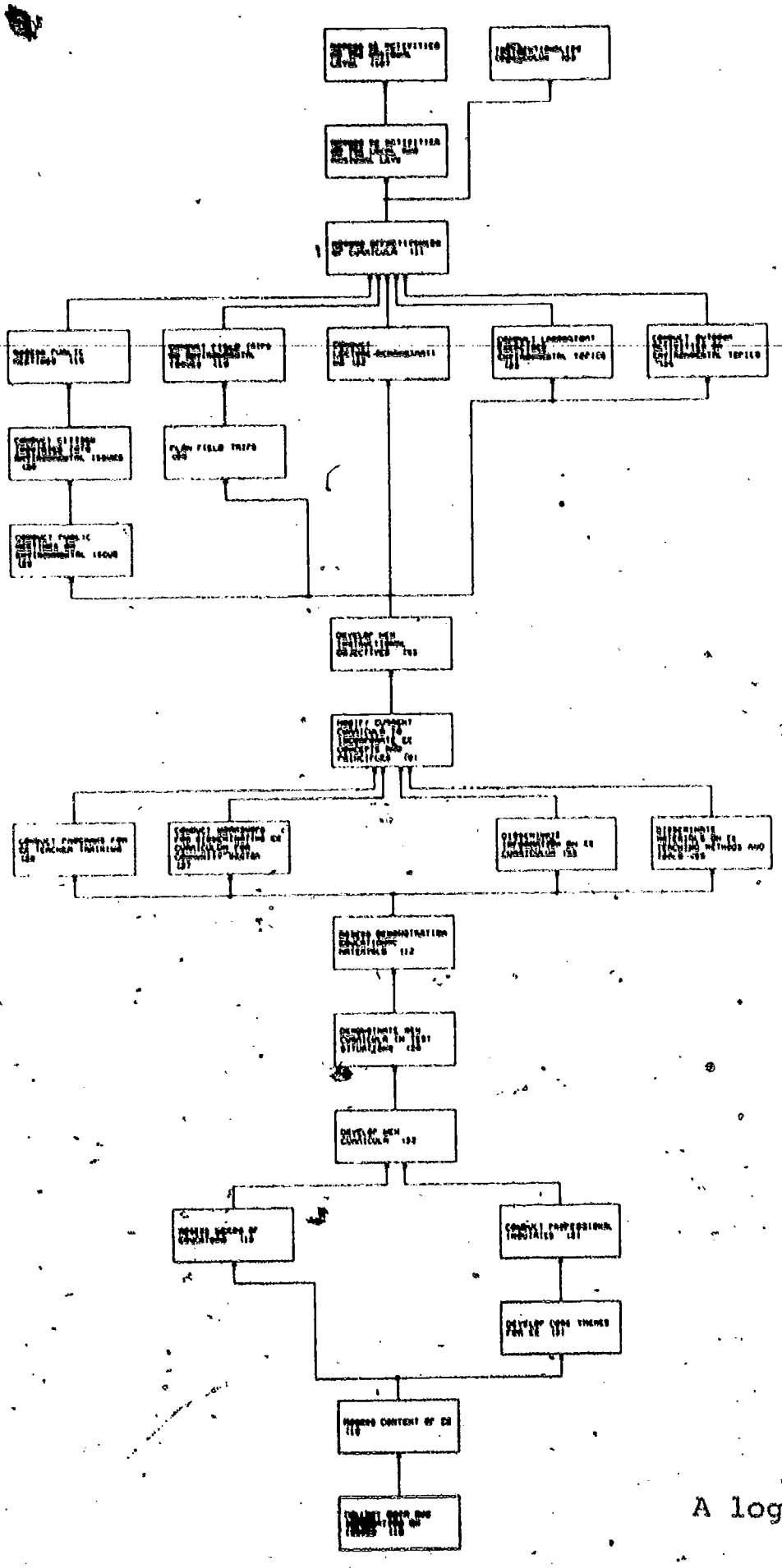
161. MAKE SUMMATIVE EVALUATION OF ENVIRONMENTAL LEARNING DESIGNS CIU

-ORGINATED BY UD GROUP IN 21 JUNE 1978 MODELING SESSION

Appendix B

UNIVERSITY OF DAYTON'S

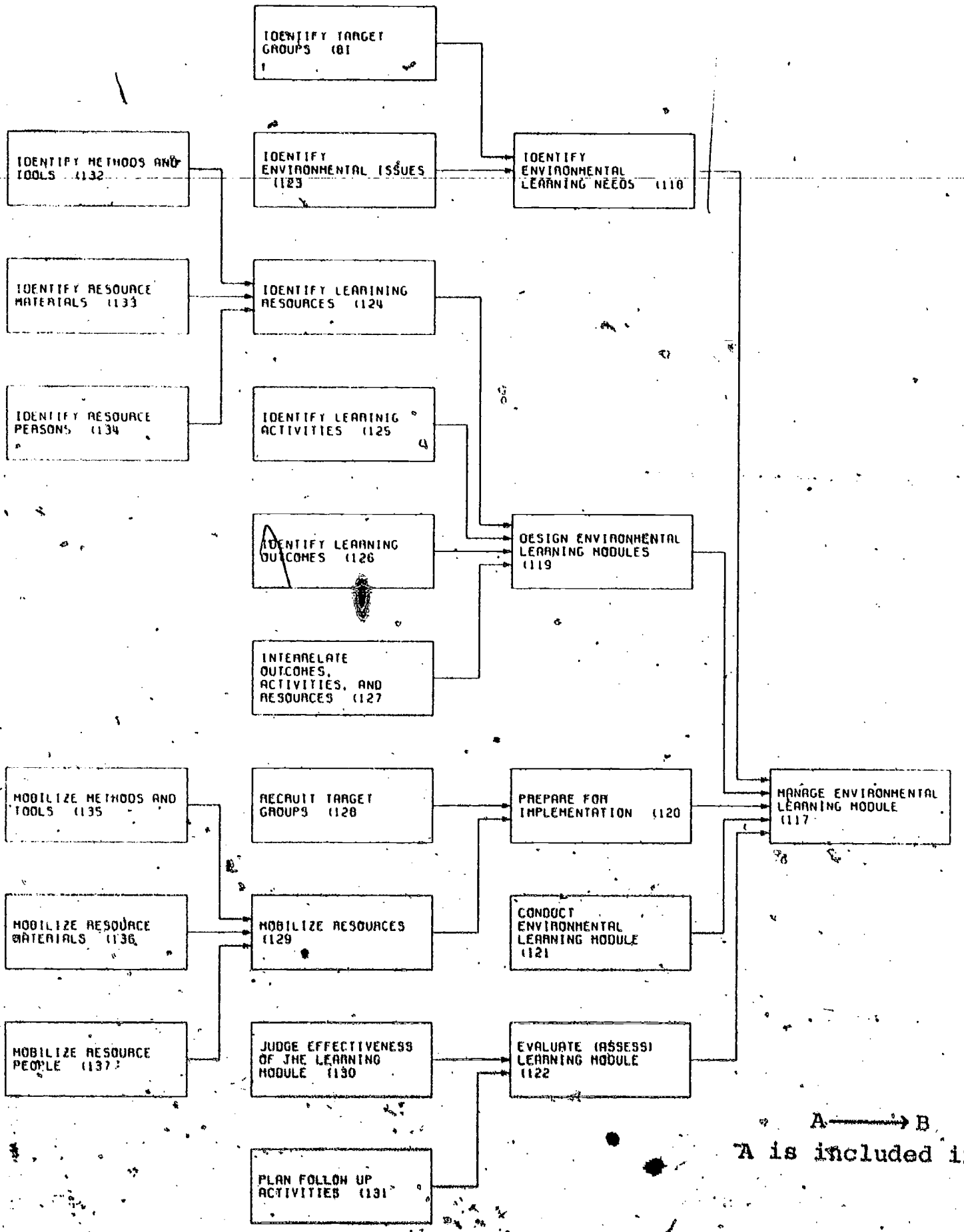
PRELIMINARY MODELS



A ⟶ B

A logically precedes B

University of Dayton Preliminary Model



University of Dayton Preliminary Model